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Type Studies on Agarics¹

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A comparatively short time ago type studies on Agarics were of no value except for identification of non-authentic material and were based almost exclusively on the macroscopic appearance of the carpophores and a rough comparison of shape and size of the spores. As a result of the progress made in the last few years in discovering anatomical characters of value in the study of the Agaricales, a properly preserved specimen, even a hundred or more years old, may furnish the decisive anatomical and chemical characters necessary for determining its relation to one of the modern smaller and more natural genera of Agaricales. The amyloidity of spores and hyphae is found to be constant and practically the same in Libert's and Klotzsch's collections as in recently collected specimens. The following type studies have been undertaken with the purpose of enlarging the number of species which can be classified in one of the modern taxonomic groups. Such rearrangement of American material on a larger scale is attempted here for the first time.

It makes little difference whether or not mycologists are inclined to recognize the use of "small genera" at the present time. Lange² and Imai³ have—in some cases—subordinated the modern genera to the genera of Saccardo as subgenera or sections, while in my own papers I am using the "small genera" as the main generic units, subordinating to them, in some cases, the groups of Friesian origin (for instance in *Rhodophyllus*), as do almost all contemporary French authors. Authors may choose whatever treatment they wish to follow, but the principles leading to the "small genera" are not avoidable in any modern work on Agaricales, whether one gives them the first place in taxonomy or a secondary position within the hierarchy of the Friesian names. In the latter case there is nothing wrong,

¹ Contribution from the Laboratories of Cryptogamic Botany and the Farlow Herbarium, Harvard University, no. 200.

² Lange, J. E. *Flora Agaricina Danica*. Copenhagen, 1935-40.

³ Imai, S. Studies on the Agaricaceae of Hokkaido. *Jour. Facult. Agric. Hokkaido Imp. Univ.* 43(1-2) 1938.

if the fact is understood that in an arrangement like that the natural units are the sections and subgenera instead of the genera.

It is impossible in a special paper like this to describe properly the methods and terms used in investigating the type materials. They are described in other papers, for instance in the monographs of Heim,⁴ Kühner,⁵ Romagnési,⁶ Singer⁷ and some of them in the classical work of Fayod.⁸ I have to say only a few words about the clamp connections which I introduced into generic taxonomy of Boletineae, Agaricineae and Polyporineae. The presence of clamp connections is easily proved by observing at least a few of them somewhere in the fruit body. Their absence, however, is not always proved by finding the septa between the hyphae of a certain tissue deprived of clamps. The choice of the organ which should be studied when the statement of absence of clamp connections is desired, depends on the general structure of the fruit body. As a rule the layers consisting of parallel or slightly interwoven, moderately loose, cylindrical, thin hyphae with thin walls are to be preferred. Such hyphae are available in the epicutis of *Galerina*, in the cortex of the apical part of the stipe in *Lepiota*, in the tomentum of the base in some Marasmioideae. In some groups, absence of the clamp connections in the carpophores developed from one mycelium is not conclusive since many species of *Boletinus* are facultatively clampless, while in *Mycena* parthenogenetic forms of one species without clamp connections may give the impression that the whole species complex is clampless. In some genera the clamp connections are frequently lacking in the 2-spored races that are homothallic, but in a majority of cases, especially within the families Tricholomataceae, Leucocoprinaceae, Boletaceae, Polyporaceae and as a family character in Gomphidiaceae (clampless), Paxillaceae (clamps), Russulaceae (clampless), Hygrophoraceae (clamps), this new character shows evident advantages in taxonomy since it has helped to solve old problems like the delimitation of the genus *Omphalia* (clampless) and *Armillariella* (clampless) from *Clitocybe* (clamps), *Melanoleuca* (clampless) from *Lyophyllum* (clamps) *Clitocybe* and *Leucopaxillus* (clamps), etc.

The type studies on Agarics prove that the American and other material which in the last few years has been subjected to the first critical studies in a modern way by Alexander H. Smith and myself, falls in with the system of classification that has been established chiefly for European species.

⁴ Heim, R. Le Genre *Inocybe*. Paris, 1931.

⁵ Kühner, R. Le Genre *Galeria*. Paris, 1935.

Le Genre *Mycena*. Paris, 1935.

Utilisation du carmin acétique dans la classification des Agarics leucosporées.

Bull. Mens. Soc. Linn. Lyon, 7(7), 1938.

⁶ Romagnési, H. Essai d'un sectionnement du genre *Rhodophyllum*. Bull. Soc. Myc. Fr. 53 (3-4), 1937.

⁷ Singer, R. Monographie der Gattung *Russula*. Beih. Bot. Centralbl. Abt. II, 49, 1932.

⁸ Fayod, V. Prodrome d'une Histoire Naturelle des Agaricinées. Ann. Sci. Nat. série 7, IX, 1889.

Most of them fit perfectly in the newer or emended genera; others help to enlarge the diagnoses of these genera, which are often conceived too strictly, and only a few species are strikingly separated from the existing genera, for instance the typically American "*Collybia*" *rheicolor*. In one case (*Fayodia-Baeospora-Pseudobaeospora*) the European conception turned out to be erroneous while a richer flora in the Western Hemisphere revealed other relationships than were expected in Europe. Immediate corrections in the classification of these species are required. While not serving to stabilize nomenclature immediately, these prompt changes in taxonomic arrangement are certainly necessary to accomplish a more complete stability of nomenclature in the near future, and will serve better than any too conservative attitude.

Fam. HYGROPHORACEAE

CLITOCYBE NIVEICOLOR Murr. *Mycologia* 3: 190, 1911. Type.

Spores 10-15.7×6.3-6.8 μ , smooth, hyaline, non-amyloid; *basidia* 55-70×10-13 μ , 4-spored; *cystidia* none; *gill trama* thick, intermixed.

Conclusion: This Mexican plant is a typical *Camarophyllus*, and should be known as ***Camarophyllus niveicolor*** (Murr.) Sing. comb. nov.

TRICHOLOMA TERRAEOLENS (Peck, Ann. Rep. N. Y. St. Mus. 38: 84, 1885, as *Agaricus*) Sacc. Authentic material.

Spores 7-8.5×4.5-5.3 μ , ellipsoid, smooth, non-amyloid; *basidia* 32-52×8.5 μ ; *cystidia* none; *gill trama* regular but hyphae interwoven (2-)7-8 (-10) μ in diameter; *hyphae of the cuticle* of the pileus non-parallel, intermixed, hyaline and without membrane-pigment, smooth, 1.5-10 μ thick; *clamp connections* numerous.

Conclusion: As the typical *Tricholomata* have parallel or subparallel epicutis hyphae with intercellular pigment and without clamp connections, this species seems to be rather a *Hygrocybe* or *Lyophyllum* or a very unusual representative of the *Tricholoma-saponaceum*-group, which is anatomically nearer to *Clitocybe* and *Rhodopaxillus* than to the other *Tricholomata*. It is most probable that *Tricholoma terraeolens* belongs to *Hygrocybe*.⁹ The material seemed to be not in a condition for showing a clear carmin-reaction of the basidia, and therefore its relationship to *Lyophyllum* could not be excluded.

HYGROPHORUS BICOLOR Karst. *Symb. ad Myc. Fenn.* 4: 178, 1878, non Berk. & Br. Material authorized by Karsten was compared with fresh specimens, collected by me in 1935 and 1940 in Finland.

Pileus pure white, smooth, only slightly silky near the margin, not viscid at any time, umbonate, 40-45 mm. broad. Hyphae of the surface thinner

⁹ The use of the name *Hydrocybe* arising from an error of Karsten, which he corrected himself in other papers, is confusing and unsatisfactory.

than in the trama, strongly interwoven, none of them erect; *lamellae* colored like the pileus of *Russula fellea* (pale and dull orange yellowish), distant, thick, decurrent, but ending abruptly on the top of the stipe; *lamellulae* narrower than the lamellae and crisped; *spores* white in mass, hyaline in NH_3 , smooth, ellipsoid, non-amyloid, $7.5-10 \times 4.8-5.3\mu$; *basidia* $\pm 47 \times 6.5-8\mu$, 4-spored; *cystidia* none; *gill trama* thick, in general bilateral with a well developed mediostratum of $2-3\mu$ thick, parallel hyphae, along which the preparation easily tears under a certain pressure, and a more intermixed and not very divergent lateral stratum consisting of versiform hyphae which grow in all directions and are even sometimes broader near to the mediostratum, some of them ramose with the hyphae averaging $\pm 8\mu$ in diameter, but often thickened up to 24μ .¹⁰ Near the base of the lamellae, the trama is less differentiated and there it may be simply called intermixed. The *subhymenium* is ramose-interwoven; *stipe* white, later subconcolorous with the lamellae, slightly fibrillose-silky, particularly at the apex, tapering downward, 7.5×9 mm.; *context* white, later concolorous with the surface of the stipe, soft; *taste* mild; *odor* none. *Hyphae* with clamp connections. *Hab.* In spruce woods (*Picea excelsa*) on the ground. Autumn.

Conclusion: Kühner's description¹¹ shows a larger fruit body, but the main characters of his plant are the same. Probably he had only a more luxuriant southern form. Kühner considers this species to be a *Limacium*, and very correctly so, but those who would like to preserve the genus *Hygrophorus* in the sense of Karsten i.e. *Limacium*, have to call it *Hygrophorus Karstenii* Sacc. & Cuboni (as there exists an older *Hygrophorus bicolor* B. & Br.). This species was originally described by Karsten as a var. *silvaticus* of *Agaricus pratensis* Karst., Not. saellsk. pro Fauna et Flora fenn. 9: 344, 1868. My observations on *Camarophyllus pratensis* confirm the observations of Fayod, according to whom, the whole gill trama is intermixed.

Fam. RHODOGONIOSPORACEAE

Gen. RHODOPHYLLUS Quél (1886)

CLITOCYBE TESTACEOFLAVA Murr. Mycologia 3: 191, 1911. Type.

Spores decidedly angular, indicating a species of *Rhodophyllus*, for which the combination **Rhodophyllus testaceoflavus** (Murr.) Sing. comb. nov. is proposed.

CLITOCYBE HIRNEOLA Fr. sens. Bres. Iconogr. 3: 137, pl. 137, 2, 1928, Romell (ex herb.).

Original material collected in Italy by Bresadola and near Femsjö,

¹⁰ The opposite is seen in *Hygrocybe laeta* where the mediostratum is more intermixed and denser and the lateral stratum which here belongs to the hymenopodium consists of scattered longitudinal hyphae favoring the rupture of the preparation.

¹¹ Le Botaniste 17: 46, 1926.

Sweden (the collecting place of Elias M. Fries) by Romell. But only a part of Romell's material belongs here (for the other part see p. 110).

Spores medium thick-walled and slightly colored but not angular, $7.7 \times 5.5\mu$; *basidia* $25-30 \times 8-8.5\mu$; no clamp connections found. The spores of Romell's material are a little smaller, about 6μ long.

Conclusion: As the conception of Bresadola and Romell *pro parte* coincides, I believe that *Clitocybe hirneola* has to be understood this way. The combination **Rhodophyllus hirneolus** (Fr.) Singer is proposed. This species is not the only one which has non-angular spores in this family. There are some such forms which can easily be mistaken for members of *Clitopilopsis*, *Clitocybe*, *Collybia*, *Omphalia*, etc.

ENTOLOMA MURRAII (Berk. & Curt. Ann. Mag. Nat. Hist. 3(4): 289, 1859)
Sacc. 14: 127, 1899.

Type. (Curtis Herb.)

Spores $9-11 \times 9.5-11\mu$, type II of Romagnési's schema i.e. "subisodiametrique asymmetrique." The spores and the dried specimens were compared with authentic material of *Agaricus cuspidatus* Peck which is evidently identical. The description of *Hygrophorus Graciae* Sumstine, Mycologia 33: 19, 1941, comes also rather near to this species, but I have seen no specimens.

Conclusion: *Entoloma Murraii* = *cuspidatum* is not an *Entoloma* but a representative of the *Pascua*-group of the subgenus *Nolanea*.

As the subdivision of the genus *Rhodophyllus*, outlined in a correspondence between H. Romagnési and myself, has not yet been published, I give here a short key:

A. Spores symmetrical.

I. Stipe comparatively short, often eccentric or even lacking. Spores often cubic. Lamellae broad and broadly adnate or more often decurrent. Bluish tint lacking; pileus often silky
..... *Eccilia* Fr. em.

II. Not as above.

a. Pigment often partially violet-blue; umbilicus often scaly. Stipe rather thin, tubulose or waxy. Pileus hygrophanous or not. Cystidia none. *Leptonia* Fr.

b. Pigment never bluish; the young pileus neither depressed nor scaly. Stipe thin and fragile to thick-fleshy-fibrous. Pileus mostly hygrophanous. Cystidia sometimes present
... **Romagnesia** Sing. subgen. nov. Diag. lat.: Subgenere Entolomate et subgenere *Nolanea* analoga, sed sporis symmetricis. Sectiones Clypeati (subsect. *Nidorosi*), *Infularii* et *Versatiles*.

B. Spores asymmetrical.

I. Lamellae ascendent, rarely with cheilocystidia, sometimes with cystidia. Spores often cubic. Stipe thin and fragile. Pileus hygrophanous, brownish, white, orange, yellow, etc. without any epicutis, never viscid. *Nolanea* Fr. em.

II. Not as above: if the lamellae are ascendent, they have mostly cheilocystidia, or the pileus is rather dark brown to black, rarely truly hygrophanous. Odor often very characteristic and strong but never fish-like. *Entoloma* Fr. em.

The new combination **Rhodophyllus Murraii** (Berk. & Curt.) Sing. is

proposed. The most closely related species is *Rhodophyllus salmoneus* (Peck) Sing. comb. nov.

Fam. TRICHOLOMATACEAE

Gen. LACCARIA Berk. & Br. (1883)

AGARICUS OHIENSIS Mont., Syll. Crypt. p. 100, 1856. Type, sent from Paris to N. Y. Botanical Garden.

Spores 9–12 μ long, subglobose, ornamentation more than 2 μ high; the *basidia* 4-spored.

Conclusion: This species belongs in *Laccaria*, but the identification is difficult, because the spores are nearly those of *Laccaria pusilla* Fayod (only a little smaller) while the fruit-bodies have other colors according to the description, and have almost the size of *Laccaria ochropurpurea*, but the latter has spores of about 10 μ in diameter with spines of only 1 μ or less in height.

CLITOCYBE TRULLISATA (Ellis, Bull. Torrey Club 5: 45, 1874) Sacc. Syll. 5: 195, 1887. Type.

Spores 15–22 \times 5–10 μ , fusoid or cylindrical, smooth, internally granulate, rather thin-walled; *basidia* 45–65 \times 9–14 μ , 4-spored; *cystidia* not seen; *gill trama* non-amyloid, septae with clamp connections; *hyphae of the stipe* parallel, 5–7 μ thick, cylindrical; *hyphae of the cuticle* tangentially arranged but somewhat interwoven, subintermixed; pigment intracellular.

Conclusion: This species has evidently all characters of the genus *Laccaria*, except for the spore shape and ornamentation. Dr. D. H. Linder and Dr. E. V. Seeler, who collected this species in Massachusetts in fresh condition, are also very positive in relating it to the genus *Laccaria*. Thus the diagnosis of this genus has to be enlarged: The spores are either subglobose and spinose or gigantic (i.e. over 15 μ long) and smooth. These spores alone are characteristic enough, as they are non-amyloid and have a smaller hilar-appendix than the equally non-amyloid *Mycenella*-spores. Spores like the spores of *Laccaria trullisata* are found only in the *Pleurotoideae* in genera which are widely different in other respects. The bright colors of many *Laccariae* are not of generic significance since there are some rather rare but otherwise typical species with greyish-brown tints. On the other hand the presence of clamp connections is constant in all species, even in the formae bisporae.

Gen. ARMILLARIELLA Karst. (1881) em.

CLITOCYBE COMPRESSIPES Murr. N.A.F. 10(1): 19, 1914. Type.

Spores broad-ellipsoid to subglobose, 6–7.5 \times 4.5–5.5 μ , with moderately thin, non-amyloid, smooth walls, without hilar depression; *basidia* 25–35 \times 6(–7.5) μ , some of them (pseudoparaphyses?) sterile and with partially

thickened refringent wall; *true cystidia* none; *cuticle* consisting of radial, sub-parallel, little interwoven, cylindrical hyphae of about 5μ diameter, with brown incrusting pigment; *hyphae of the stipe* parallel. All hyphae without clamp connections. This collection shows cespitose growth on sandy soil; no rhizomorphae seen.

Conclusion: The genus *Armillariella* has to be restricted, excluding the *Pleuroti* like *Pleurotus dryinus*, and the *Biannularieae*, e.g. *Catathelasma imperiale*. It is however impossible to separate from *Armillariella mellea*, the type of the genus, such veil-less species as *Clitocybe nigropunctata*, *ectypa*, *tabescens*, *compressipes*, *Hygrophorus marginatus*, *Omphalia chrysophylla*. All these species have the same general appearance, the same variability of spore color, the same fibrillose pileus with repent radial hyphae without clamp connections. The genus as here used touches the section *Sericella* of *Tricholoma* and the genus *Omphalia* sensu strictu (the *Umbelliferae*-group) but there is comparatively little affinity between it and *Clitocybe* or the veiled *Tricholomata*, *Lepiota*, *Catathelasma* or *Pleurotus*. For *Clitocybe compressipes* Murr. the new combination ***Armillariella compressipes*** (Murr.) Sing. comb. nov. is proposed.

CLITOCYBE ALACHUANA Murr. Mimeogr. Contrib. Herb. Univ. Fla. Agric. Exp. Sta. 12, Sept. 1938, nom. nud. Type (?).

Spores $5 \times 4.3\mu$, subglobose, smooth or almost smooth, non-amyloid; *hyphae of the cuticle* $2-4\mu$ thick, not parallel, cylindrical, interwoven in all directions, incrusting by a faint membrane pigment, without clamp-connections.

Conclusion: This species belongs probably to *Armillariella* in spite of the more interwoven surface hyphae, but without the description of the carpophores in fresh condition there cannot be any definitive statement.

Gen. CLITOCYBE Fr. (1821 ut tribus Agarici)

CLITOCYBE MEXICANA Murr., Mycologia 3: 191, 1911. Type.

Spores fusoid with hilar depression $10 \times 3-4\mu$, thin-walled, smooth, non-amyloid; *basidia* $30 \times 5\mu$.

Conclusion: This species belongs to the *Inornata*-group of the genus *Clitocybe*.

CLITOCYBE AVELLANEIALBA Murr. Mycologia 5: 208, 1913. Type.

Spores fusoid, acuminate at both ends, $10-11.5 \times 4.5-5\mu$, with numerous droplets inside, with a smooth, non-amyloid, thin membrane; *basidia* $30-40 \times 7.5-9\mu$, 4-spored.

Conclusion: Although compared with *Collybia platyphylla* by the author (because of the spores which, however, are not globose as indicated by Murrill), it is not related to that species but it is a *Clitocybe* of the *Inornata*-group.

MELANOLEUCA AVELLANEA Murr., Mycologia 5: 215, 1913. Type.

Spores subellipsoid to fusoid, $7-9 \times 3.5-4\mu$, non-amyloid, smooth or nearly smooth, hyaline; *basidia* $30-35\mu$ long, 4-spored; *cystidia* none; *hyphae of the cuticle* $3-5\mu$ thick, smooth, not strongly parallel, with clamp-connections.

Conclusion: This is not a *Melanoleuca* species, but it seems to belong to the *Inornata*-group of *Clitocybe*. The combination **Clitocybe avellanea** (Murr.) Singer comb. nov. is proposed.

TRICHOLOMA LATUM Peck, Bull. N. Y. St. Mus. 167: 31, 1913. From type locality.

Spores fusoid, $8-12 \times 3-4.2\mu$, hyaline, smooth, multiguttulate, non-amyloid; *basidia* $26-39 \times 6-7\mu$; *trama* regular; *lamellae* grey; *pileus* whitish, not shining.

Conclusion: Same as for the preceding species. The combination **Clitocybe lata** (Peck) Singer comb. nov. is proposed.

CLITOCYBE HARPERI Murr., Mycologia 5: 209, 1913. Type.

Spores $5-6.3 \times 3-3.5\mu$, smooth, ellipsoid, with hilar depression, thin-walled, non-amyloid.

Conclusion: This species belongs to the *Nebularis*-group of *Clitocybe*. It is very close to *C. nebularis*.

CLITOCYBE OVERHOLTSII Murr. N.A.F. 9(6): 403, 1916. Type.

Spores ellipsoid-oblong, $6-6.8 \times 3-4.2\mu$, thin-walled, non-amyloid, smooth, multiguttulate; *basidia* $26 \times 5-6\mu$; *hyphae* with clamp-connections.

Conclusion: A synonym of *Clitocybe nebularis*.

CLITOCYBE OREADES Murr., Mycologia 5: 213, 1913. Type.

Spores ellipsoid-oblong or ellipsoid, thin-walled, $6-9 \times 3-4\mu$, non-amyloid, smooth, hyaline; *basidia* $25 \times 5.3-5.7\mu$, 4-spored, very few 2-spored.

Conclusion: One more synonym of *Clitocybe nebularis*.

CLITOCYBE GRISEIFOLIA Murr., Mycologia 5: 208, 1913. Type.

Spores ellipsoid, non-amyloid, $5 \times 2.9-3.5\mu$; *basidia* $30 \times 5\mu$, 4-spored; *hyphae* non-amyloid.

Conclusion: It is a true *Clitocybe* of the *Brumalis*-group.

CLITOCYBE SUBBULBIPES Murr., N.A.F. 9(6): 404, 1916. Type and one later collection.

Spores $5-5.7 \times 2.5-3.8\mu$ ($5.7 \times 3.8\mu$ in the type specimen), smooth, thin-walled, non-amyloid; *basidia* $20-24 \times 5\mu$, 4-spored; *trama* regular.

Conclusion: This species is a typical *Clitocybe*. It is a remarkable fact that it was collected by L. N. Vasilieva in the Caucasus Mountains and

determined by me (cf. Vasilieva, L. Les Champignons de la Reserve caucasienne, Uchen. Zap. Kaz. Gos. Univ. 99(1): 50, 1939). The two collections from the Adirondacks and from the Caucasus are perfectly identical, as I can now state. My microscopical data on the fungus of Vasilieva are: *Spores* $5.7-6.3 \times 4-4.6\mu$, hyaline, non-amyloid, thin-walled. The taste of the flesh is mild. It grew on fruit of *Fagus orientalis*.

CLITOCYBE PECKII Murr., Mycologia 5: 211, 1913. Type.

This slender fungus belongs to *Clitocybe* sens. lato Singer. It is a representative of that large group of *Omphaliae* with incurved margin and moderately distant to close lamellae, non-amyloid spores and hyphae with clamp-connections. All these species are really not different from the hygrophanous species of *Clitocybe*, except for the more slender stipe and thinner pileus, and they pass over into *Clitocybe* without any hiatus. The typical *Omphaliae* (as *Omphalia umbellifera*, *philonotis*) have no clamp-connections and distant lamellae. Most of the pigmentless and orange species of *Omphalia* (as *Omphalia candida* and *fibula*) have cystidia and dermatocystidia or diverticulate pileus hyphae and belong to the genus *Hemimycena*. The species with amyloid spores are either *Xeromphalina* or *Mycena*.

CLITOCYBE VIOLACEIFOLIA Murr., Mycologia 5: 313, 1913. Type.

Spores $7-9 \times 4.5-6\mu$, mostly $7-8 \times 4.5-5\mu$, ellipsoid, smooth, non-amyloid; *basidia* $36-41 \times 6-9\mu$; *cuticle* of the pileus consisting of smooth, filamentous, interwoven hyphae with clamp-connections.

Conclusion: This species belongs to the same group as the preceding one. There is a rather near but distinct species in Asia with the same color of the lamellae (*Clitocybe hyacinthina*), and in North America there is another one, also closely related, but distinct (*Clitocybe lilacifolia* (Peck) Sing.)

OMPHALIA LILACIFOLIA (Peck 1878 ut Agaricus) Peck, Ann. Rep. N. Y. St. Mus. 45: 94 (34), 1893. "Fragments of Albany types."

Spores $5.5-7 \times 3-4\mu$, ellipsoid, thin-walled, non-amyloid, hyaline; *basidia* about $22 \times 5\mu$; *trama* non-amyloid; *cuticle* consisting of interwoven, hyaline, smooth hyphae; *hyphae* of the surface of the stipe normal to rather thick, with clamp-connections. The fruit bodies are now alutaceous-pale. *Lamellae* distant, not crowded.

Conclusion: Same as for the two preceding species. The combination *Clitocybe lilacifolia* (Peck) Singer comb. nov. is proposed.

CLITOCYBE XANTHOPHYLLA Bres., Fung. Trid. 1: 8, 1881. Coll. and determined by Bresadola.

This species is characterized by the presence of clamp-connections (thus not an *Omphalia*, as Bresadola and Maire later thought, and no change of name is necessary), non-amyloid spores (thus distinct from the similar

Fayodia-lacerata-group); basidia without carminophilous granulations, thus not a *Lyophyllum*, as I assumed formerly. This species has often white, not yellow lamellae, and this form is rather frequent in certain parts of eastern Europe. My notes on this material follow:

Spores, $6-7.7 \times 3-3.8\mu$, with hilar depression, moderately thin-walled, non-amyloid, 1-guttulate; *basidia* without carminophilous granulations, $34-48 \times 5.8-8\mu$, 4-spored; *cystidia* and *cheilocystidia* none; *hyphae of the cuticle* radial, with moderately numerous clamp-connections; *hyphae of the base of the stipe* thin-walled; *lamellae* whitish, distant or subdistant, often forking with connecting rugose veins; *stipe* whitish-greyish; *taste* slightly bitterish. On decayed wood of *Pinus* and *Picea*.

Conclusion: This species is closely related to *Clitocybe epichysium* (Pers.) Singer (non Velen.) which however has larger spores: $7.5-10 \times 3.2-5\mu$.

CLITOCYBE ROBINSONIAE Murr. N.A.F. 9(6): 400, 1916. Type.

Spores ellipsoid-oblong, $(5-)6(-7) \times 2\mu$, non-amyloid, hyaline, smooth; *basidia* $22 \times 5\mu$; *trama* regular.

Conclusion: A characteristic species because of the narrow spores which recall *Clitocybe calcarea* Velen., a species of the European and Asian steppes.

CLITOCYBE SUBCONNEXA Murr., Mycologia 7: 272, 1915. Type.

Spores shortly ellipsoid, rough, non-amyloid, $4.8-5 \times 2.9-3.5\mu$.

Conclusion: This species belongs to the *Inversa*-group of *Clitocybe*.

CLITOCYBE VARIABILIS Murr., Mycologia 5: 213, 1913. Type.

Spores $5-8 \times 3-5\mu$, smooth, shortly ellipsoid, thin-walled, with or without a hilar depression, with 1 or several oil drops; *basidia* $32-37 \times 5-7\mu$, 4-spored; *hyphae* with clamp connections; *tomentum* of the base consisting of filaments of strongly parallel, hyaline, smooth hyphae, including fir-needles and detritus; *lamellae* very narrow, subdistant; *stipe* solid, only at last hollow in the lower part.

Conclusion: The name of this typical *Clitocybe* is indicative of the variable size of the fruit body as well as of the spores, whose size and shape are very variable. Smaller specimens in general have smaller spores.

CLITOCYBE REGULARIS Peck, Bull. N. Y. St. Mus. 10: 984, 1902. Type.

Spores $4-5.2 \times 2.5-3.8\mu$; *basidia* $18-20 \times 4-4.5\mu$; *trama* regular; *stipe* between leaves, rather thick and straight; *lamellae* moderately crowded.

Conclusion: This species belongs to the large group of almost pigmentless species of *Clitocybe* (*C. dealbata*, *pithyophila*, etc.)

CLITOCYBE WASHINGTONIENSIS Murr., Mycologia 5: 214, 1913. Type.

Spores $5-6 \times 3.3-4.5\mu$, ellipsoid, smooth, non-amyloid, thin-walled; *basidia* $21 \times 5\mu$, 4-spored; *trama* of the lamellae regular; *hyphae* $5-6\mu$ in diameter, thin-walled, hyaline, with clamp-connection.

Conclusion: Same as for the preceding species.

CLITOCYBE MURINIFOLIA Murr., *Mycologia* 5: 210, 1913. Type.

Spores $3-4 \times 2.3-2.6\mu$, smooth, hyaline, non-amyloid.

Conclusion: A synonym of *Clitocybe ditopa*.

CLITOCYBE EXPALLENS (Pers.) Fr. sens. Bres., *Iconogr. Myc.* 4: 176, pl. 176. 1928. Specimens collected and determined by Bresadola in Gocciadoro near Trento, Italia, November, 1900.

Spores $4.7-6 \times 3-3.5\mu$, non-amyloid; *basidia* $33-36 \times 4.8-6.5\mu$, 4-spored.

Conclusion: This species is actually, as Bresadola says, "a *Clitocybe cyathiforme* optime diversa," as the spores are not only smaller but also not amyloid. Fries gives two pictures of *Agaricus expallens*, the lower one very much like a small *Cantharellula cyathiformis*, while the upper one corresponds to a form of the *Vibecina*-group (*C. vibecina* Fr., sens. Konr. & Maubl.; **C. Langei** nom. nov. = *vibecina* Ricken, Lange, and *C. metachroa* Fr.). Bresadola's plant belongs to the latter group. It would not be surprising if *Clitocybe expallens* Fr. sens. Bres. was the same as *Clitocybe metachroa* or *vibecina* as either of them in the sense of Bresadola differs from the current conception.

MELANOLEUCA SUBFULIGINEA Murr. N.A.F. 10(1): 21, 1914. Type.

The type specimen (Murrill says in his notes it is undeveloped) has *spores* that measure $6-6.8 \times 3-3.5\mu$, while those of other specimens are $9-11 \times 3.7-5\mu$ and are non-amyloid. The *basidia* measure $32 \times 4\mu$; *hyphae* of the gill-trama very parallel, regular, $2.8-6.5\mu$ thick and many septa with clamps.

Conclusion: As I have not tested the carmin-reaction of the basidia, I am not able to state whether this species belongs in the neighborhood of *Lyophyllum fuligineum* (Peck) Singer or to *Clitocybe*.

OMPHALIA JALAPENSIS Murr., N.A.F. 9(5): 349, 1916. Apparently the type.

Spores broad-ellipsoid, $4.5-3\mu$, non-amyloid, smooth; *basidia* $24-27 \times 4.8-5\mu$; *cheilocystidia* not striking, very scattered, filamentous; *trama* hyaline, non-amyloid, intermixed with some rare vesiculose bodies of $20-23 \times 7-15\mu$, while the normal hyphae are $2-6.5\mu$ thick. All hyphae with clamp connections.

Conclusion: This species belongs to *Clitocybe*. I propose the combination: ***Clitocybe jalapensis*** (Murr.) Singer comb. nov.

AGARICUS GRISEOPALLIDUS Desmaz., Exs. Crypt., ser. I, fasc. 3, #120, 1824.
Part of the type.

Spores $8.5-10.5 \times 5-5.4\mu$, smooth, non-amyloid; *basidia* $30-35 \times 7.5-8.3\mu$, 2-spored; *cystidia* none; *gill-trama* regular-interwoven, the hyphae incrustated by a brown pigment and constantly with clamp-connections; *cuticle* of the pileus consisting of repent cylindrical hyphae which are incrustated by a brown pigment.

Conclusion: This species belongs to the small "*Omphaliae*" which are generally considered as very distinct from *Clitocybe*. However, the microscopical analysis shows that all characters are the same as in *Clitocybe* except for the intercellular pigment. The combination ***Clitocybe griseopallida*** (Desmaz.) Singer comb. nov. is proposed.

Gen. OMPHALIA Fries (1821 ut tribus Agarici), sens. str.

AGARICUS (OMPHALIA) TELMATIAEA Berk. & Cke., Handb. ed. II: 93, 1885 (non 1883). Type: On peatbogs, Scarboro, 1882.

This is in every regard like *Omphalia philonotis* (Lasch) Fr. = *Omphalia sphagnicola* (Berk. ap. Smith) Fr. and only a second synonym of that species.

Gen. RHODOPAXILLUS Maire (1913) em. Sing. (1936)

CLITOCYBE BROADWAYI Murr., Mycologia 3: 192, 1911. Type.

Spores $6-8 \times 4-5\mu$, strongly warted, ellipsoid, non-amyloid; *basidia* $20-24 \times 6.5\mu$; *cystidia* none.

Conclusion: This is a good species of *Rhodopaxillus*; ***Rhodopaxillus Broadwayi*** (Murr.) Sing. comb. nov.

MELANOLEUCA HARPERI Murr., Mycologia 5: 217, 1913. Type.

Spores $(6-)7 \times 4(-5)\mu$, ellipsoid, slightly but visibly rough, non-amyloid, with an evident hilar depression; *basidia* $30 \times 8\mu$, 4-spored; *hyphae of the cuticle* repent, interwoven, $1-6\mu$ thick, with clamp-connections; *taste* mild. General appearance very much like *Melanoleuca brevipes*.

Conclusion: This is a *Rhodopaxillus* and belongs to the group of *Rhodopaxillus nimbatus*.

MELANOLEUCA RUDERICOLA Murr., Mycologia 5: 220, 1913. Type.

Spores $6.3-9 \times 3.8-4.8\mu$, evidently rough under oil immersion, non-amyloid; *basidia* $31-38 \times 6-8\mu$.

Conclusion: Very near to the preceding species, belonging likewise to *Rhodopaxillus*.

AGARICUS (TRICHOLOMA) GEORGII MacOwan & Kalchbr., Grevillea 9(5): 109, 1881. Coll. MacOwan, distr. Kalchbrenner.

Spores $6.5-7.5 \times 4-5.2\mu$, strongly warted, non-amyloid, ellipsoid; *basidia* without carminophilous granulation; the *pileus* of the specimens preserved at the Botanical Institute of the Academy of Science in Leningrad is much larger than indicated in the joint description, for it is about 10 cm. However, the size is the only real difference that I can see between *Tricholoma Georgii* in the sense of Kalchbrenner and *Tricholoma cafferorum* Kalchbr. & MacOwan of the same author. The idea Kalchbrenner had of *Tricholoma Georgii* is quite different from the idea Fries had of this species and the varieties he considered as species (*gambosus* etc.). The right name for the latter plant is *Lyophyllum gambosum* (Fr.) because of the reaction of the basidia with aceto-carmin which it has in common with numerous other white-spored Agarics (see later in this paper). Kalchbrenner determined as *Agaricus Georgii* still another species without granular carminophilous contents in the basidia: a white edible mushroom from China. I examined the specimens and found that they are identical with *Tricholoma mongolicum* Imai (see later, p. 111).

Conclusion: The South African "*Agaricus Georgii*" is a *Rhodopaxillus* and is probably identical with ***Rhodopaxillus cafferorum*** (Kalchbrenner) Singer comb. nov.

I add some notes on *Lyophyllum gambosum* var. *flavidum* Bres. (authentic material) for comparison; *Spores* $4.5-5.3 \times 2.5-3\mu$, hyaline, smooth, ellipsoid, with hilar depression; *basidia* with carminophilous granulation; *laticiferae* in the regular gill-trama and in the trama of the stipe 3-10 μ thick; *hyphae* 1-4 μ thick, with clamp-connections.

Thus, in spite of Saccardo's indications which are based on the data of Kalchbrenner, *Lyophyllum gambosum* = *Tricholoma Georgii* is strictly confined to Europe. It is extremely rare in eastern Europe and there are no reliable specimens which might prove its existence in Asia or Africa.

MELANOLEUCA PRAEMAGNA Murr., N.A.F. 10(1): 13, 1914. Type.

Spores very slightly round to smooth, $6-7 \times 4.4-5\mu$; *basidia* $25-36 \times 8\mu$; *hyphae* with clamp connections. The spores are described as "pure white in mass."

There are two other collections determined as *Melanoleuca praemagna* in the Herbarium of the N. Y. Botanical Garden, both collected by Overholts.

Microscopical notes taken by me from the dried material: Collection (1): *Spores* almost smooth, $6-9(-11) \times 4.5-5.5(-6.5)\mu$, mostly $8 \times 5\mu$; *basidia* $36 \times 7-8\mu$; *hyphae* with clamp connections. Collection (2): *Spores* slightly but evidently rough, $6.5-7.5 \times 4.7-5\mu$. Spores of a spore print found in this preparation distinctly dirty pinkish.

Conclusion: Thanks to the good description of L. O. Overholts¹² there is no doubt that the specimens he collected near Tolland and Boulder Park,

¹² For the macroscopical description see L. O. Overholts, *Torreyana* 16: 198, 1916.

belong to *Rhodopaxillus*. If they are really identical with Murrill's *Melanoleuca praemagna*, then this latter species can hardly have pure white spore print. If they are not identical, Overholts's species has to be considered as a new species.

MELANOLEUCA OLESONII Murr., *Mycologia* 5: 218, 1913. Type.

Spores $7-8 \times 4.5-5\mu$, ellipsoid, hyaline, slightly rough to nearly smooth, non-amyloid, with a hilar depression, with 0-1 small oil drop; *cuticle* consisting of dense, interwoven, cylindrical hyphae with clamp-connections; the *hyphae* of the context still more interwoven-irregular; *lamellae* broader than in *Melanoleuca praemagna* Murr.

Conclusion: This species belongs to *Rhodopaxillus*, if the spores are pink in mass, which is rather probable.

MELANOLEUCA NUCIOLENS Murr., *Mycologia* 5: 218, 1913. Type.

Spores $7-7.5 \times 3.5-5\mu$, rough, and when accumulated pale incarnate even under the microscope; *basidia* $32-40 \times 6-7\mu$, 4-spored; *cystidia* none; *trama* regular; *cuticle* consisting of unequally broad and much interwoven repent hyphae. An odor of walnut is preserved until today. The lamellae are rather narrow, more narrow than in *Rhodopaxillus nitellinus*. No clamp-connections seen.

Conclusion: This species seems to be very near to *Rhodopaxillus nitellinus* and *truncatus*, except for the lacking (?) clamp connections. This is the only case in which I could not find clamp connections in a specimen which evidently belongs to a genus or group characterized by the presence of clamp-connections, but it is possible that in the section *Nitellinae* Sing. parthenogenetic forms are occasionally produced.

Gen. RHODOCYBE Maire (1924)

CLITOCYBE HIRNEOLA Romell p.p. ined. (ex herb.) Part of the material determined *Clitocybe hirneola* and sent to the N. Y. Botanical Garden does not belong to this species (see p. 101). It is collected at Femsjö, the historic collecting place of E. M. Fries.

Spores hyaline, $7.7-4.7\mu$, non-amyloid, thin-walled, rough; *basidia* $21-31 \times 5-7.7\mu$; *pseudocystidia* $25-42 \times 4.3-8.5\mu$, orange-brown, fusoid, smooth, very numerous at the subheteromorphous gill-edge, still rather numerous on the sides of the lamellae; *trama* of the lamellae regular, consisting of parallel, non-incrusted hyphae of $2.5-2.7\mu$ diameter; *cuticle* consisting of interwoven, repent, dark brown hyphae of $3.5-7.7\mu$ diameter incrusted by a membrana-pigment and not showing clamp connections.

Conclusion: Romell's material proves that the mycoflora of Femsjö contains not only *Rhodophyllum hirneolus* (Fr. sens. Bres.), but also *Rhodocybe*

caelata (Fr.) Maire. The above-described plant is nothing else but this latter species.

Gen. TRICHOLOMA Fr. (1821 ut tribus Agarici)

AGARICUS (TRICHOLOMA) GEORGII Kalchbrenner, Bull. Acad. Imp. Sci. St. Petersburg, Melanges Biologiques 11: 57, 1880. Type.

Specimen from the market of the town Kobdo, Potanin 29: *Spores* $8.3-9 \times 4-5\mu$, hyaline, non-amyloid, smooth; *basidia* without carminophilous granulation; *clamp connections* present.

Specimens from China, Bretschneider 37; *Spores* $8.3 \times 4-5\mu$, hyaline, non-amyloid, smooth; *clamp connections* present.

Conclusion: Kalchbrenner's Asian material of what he calls *Agaricus Georgii*, non Fries nec al. is *Tricholoma mongolicum*, a very important edible mushroom, as it grows in the steppes and deserts of central and eastern Asia where no other edible species are found. I have seen material from Kuraiski steppe, Altai (leg. R. Singer), different parts of Kazakhstan (leg. Nevodovski; leg. Sergeeva), China (comm. Prof. Hemmi), and the above-mentioned collections (Kobdo is situated in the Mongolian People's Republic; the locality where Bretschneider collected is unknown to me, as the names mentioned by Kalchbrenner are not names of localities but the names of the mushroom, one of which, by the way, is almost identical with the popular names indicated by Imai for *Tricholoma mongolicum*.)

The whole group of white *Tricholomata* with clamp connections is rather near to some white *Rhodopaxillus*. From the anatomical point of view the whole section *Rigida* Fr. of *Tricholoma* (with clamp connections), the whole genus *Rhodopaxillus* and the numerous species of *Clitocybe* are hardly generically separable. They are separated by the pink color of the rough spores in *Rhodopaxillus*, the white, green, yellow or pink color of the spores (which are smooth if colored) in *Clitocybe*, from which *Tricholoma-Rigida* is not distinguished except for the decidedly sinuate (instead of decurrent) lamellae. One may expect that in the near future all these groups will be united in a tribe *Clitocybeae*. But as there are no real transitions known between them, the present classification is as traditional (in leaving *Tricholoma saponaceum* in *Tricholoma* and retaining the well introduced and natural genus *Rhodopaxillus* Maire) as it is practical and needs no change unless transitions are really found.

MELANOLEUCA SUBLURIDA Murr., Mycologia 5: 221, 1913. Type.

MELANOLEUCA SUBARGILLACEA Murr., N.A.F. 10(1): 19, 1914. Type.

MELANOLEUCA VOLKERTII Murr., N.A.F. 10(1): 20, 1914. Type.

MELANOLEUCA TOTTENII Murr., N.A.F. 10(1): 21, 1914. Type.

All these species have the same general appearance and almost identical microscopical characters: *Spores* $4-6.8 \times 2-4\mu$, sub-ellipsoid with hilar

applanation or a shallow depression, hyaline, smooth, non-amyloid, thin-walled, guttulate; *basidia* $20-36 \times 3.4-7\mu$; *cystidia* none; *trama* subintermixed; *hyphae of the cuticle* $2.5-5\mu$ thick, without membrana-pigment, irregularly interwoven; *hyphae of the stipe* with a few clamp connections.

Conclusion: The four species are all identical. They are likewise identical with a specimen of *Tricholoma striatifolium* Peck, collected by Earle (but I have not seen the type). They are extremely close to and perhaps identical with *Tricholoma sudum* Fr. sens. Lange.

TRICHOLOMA OLIVEUM Farlow & Burt, Icones Farlowianae, Pl. 16: [18] 1929. Type.

Spores $5.3-7 \times 4-4.3\mu$, ellipsoid, hyaline, with a slight hilar depression, non-amyloid; *basidia* $20-25 \times 6-6.5\mu$, 4-spored; *cystidia* none; *trama* regular-interwoven; *hyphae of the cuticle* interwoven, smooth and without incrusting pigment, but with clamp-connections.

Conclusion: Very near to or perhaps identical with *Tricholoma saponaceum*.

AGARICUS VIRIDITINCTUS Peck, Ann. Rep. N. Y. St. Mus. 33: 36, 1883. "Fragments of Albany types."

Spores ellipsoid or broadly ellipsoid with hilar depression $(6-)7 \times 3.5-5\mu$, hyaline, smooth, thin-walled, non-amyloid, with none or numerous drop-lets; *basidia* $26-38 \times 6.2-8\mu$; *trama* of the lamellae regular, interwoven; *hyphae of the cuticle* strongly interwoven; *hyphae of the base of the stipe* cylindrical with clamp-connections.

Conclusion: Probably near *Tricholoma saponaceum*. Murrill thinks that this part of Peck's collections must be different from the rest and adds (in sched.) "not *viriditinctum* but *fumidellum*." I am personally more inclined to believe it is really *Tricholoma viriditinctum*.

MELANOLEUCA FARINACEA Murr., Mycologia 5: 217, 1913. Type.

Spores narrow-ellipsoid, smooth, non-amyloid, hyaline, $4-6 \times 2-3\mu$; *basidia* $24-27 \times 4-5.5\mu$; *cystidia* none; *gill-trama* regular; *clamp connections* numerous.

Conclusion: This species belongs in the same group as *Tricholoma monogolicum*.

AGARICUS (TRICHOLOMA) CHRYSENTEROIDES Peck, Ann. Rep. N. Y. St. Mus. 24: 60, 1872. Type.

Spores $6-6.6 \times 4\mu$, hyaline (or brownish), non-amyloid, smooth; *basidia* $25 \times 5-6.5\mu$, some brownish; *gill-trama* regular; *hyphae of the cuticle* brown, evidently incrustated by the pigment, interwoven, $2-5\mu$ thick, without clamp connections.

Conclusion: A good species of *Tricholoma* belonging to the section *Sericella*.

MELANOLEUCA PLATYPHYLLA Murr., *Mycologia* 5: 219, 1913. Type.

Spores 11-13 \times 6-7 μ , ellipsoid, with 0-1 oil drop, with a thin, smooth, hyaline, non-amyloid membrane, sometimes with a dorsal depression (on the outer part); *basidia* 42-49 \times 9-10.5 μ ; *hyphae of the epicutis* interwoven and thinner than in the subjacent layer (the hypoderm), no incrusting pigment seen; *clamp connections* lacking. The pileus is interruptedly and faintly pale silky under a lens.

Conclusion: Same as for the preceding species.

TRICHOLOMA ODORUM Peck, Bull. Torrey Bot. Club 25: 321, 1898. Type.

Spores ellipsoid-subfusoid, with hilar depression, 9-10 \times 5-6.2 μ , non-amyloid, smooth, hyaline, multiguttulate, thin-walled; *basidia* 33-40 \times 8-9 μ , 4-spored; *gill-trama* subintermixed; *hyphae of the cuticle* about 1.5-2 μ thick, interwoven, no clamp-connections seen.

Conclusion: A good species of *Tricholoma* belonging to the section *Sericella*. There is an extremely closely related form in Europe, *Tricholoma sulphureum* var. *rhodophyllum* Metrod, *Revue de Mycologie* 4(3-4): 104, 1939. It can be distinguished by its habitat in dry grass land, and in the color of the stipe.

TRICHOLOMA GAUSAPATUM Fr. sens. Bres., *Icon. Myc.* 2: 79, 1927. Authentic material, coll. and det. Bresadola: Montevaccino, Italy, November, 1898.

Spores 6-7.5 \times 4-4.5 μ , smooth, with hilar depression, with moderately thin membrana, and with numerous drops; *hyphae of the epicutis* parallel and without clamp-connections.

Conclusion: A species of subgenus *Eu-Tricholoma* (which is characterized by parallel epicutis-hyphae and lacking clamp-connections), thus not related to *Tricholomopsis platyphylla*, to which it seems similar.

ARMILLARIA ARENICOLA Murr., *Mycologia* 4: 212, 1912. Type.

Spores subglobose, 6-8 \times 5-6.2 μ , smooth, thin-walled, non-amyloid, but some pseudoamyloid, 1-guttulate; *hyphae of the epicutis* hyaline, smooth, subparallel, 5-10 μ thick, without clamp connections.

Conclusion: A species of subgenus *Eu-Tricholoma*, near *Tricholoma caligatum*. The new name ***Tricholoma Murrillianum*** Singer nom. nov. is proposed.

AGARICUS MAGNIVELARIS Peck, Ann. Rep. N. Y. St. Mus. 29: 66, 1878. "Typical."

Spores 5.7-9 \times 4.5-5.8 μ , broadly ellipsoid, smooth, thin-walled, non-amy-

loid, but some pseudoamyloid; *basidia* $28 \times 5.5-6\mu$; *hyphae of the veil* filamentose, moderately thick-walled, hyaline, $5-12\mu$ broad, without clamp connections.

Conclusion: A species of subgenus *Eu-Tricholoma*, near *Tricholoma caligatum*. However, since *Tricholoma ponderosum* is the older name (and *Agaricus ponderosus* Pers. is pre-Friesian) I see no reason for rejecting it.

MELANOLEUCA CALIFORNICA Murr., Mycologia 5: 216, 1913. Type.

Spores $5.6-7 \times 4-5.5\mu$, with 1 oil drop and with hilar depression, broadly ellipsoid; *basidia* $30-36 \times 6\mu$; *hyphae of the epicutis* subparallel; no veil seen.

Conclusion: A species of subgenus *Eu-Tricholoma*, near *Tricholoma ustale*.

MELANOLEUCA ANGUSTIFOLIA Murr., N.A.F. 10(1): 22, 1914. Type.

Spores $5-7 \times 3-4\mu$, ellipsoid, with hilar depression, smooth, non-amyloid, hyaline; *basidia* $21-28 \times 6\mu$, 4-spored; *hyphae of the epicutis* $3-7\mu$ broad, non-parallel, evidently interwoven, but with a general radial arrangement; *hyphae of the tomentum* of the base of the stipe $5-9\mu$ thick with frequent septae but without clamp connections.

Conclusion: A species of *Eu-Tricholoma* near *Tricholoma equestre*.

MELANOLEUCA YATESII Murr., N.A.F. 10(1): 29, 1914. Type.

Spores $5.5-6.5(-7) \times 3-4(-4.5)\mu$, hyaline, cylindrical-ellipsoid or more often ellipsoid, with hilar applanation, smooth, non-amyloid; *basidia* $30-45 \times 7-8\mu$, 4-spored; *hyphae of the epicutis* $2.5-4.5\mu$ thick, parallel, incrustated by a yellow-brown membrana-pigment; no clamp connections.

Conclusion: A species of the subgenus *Eu-Tricholoma* near *Tricholoma equestre* and *sejunctum*.

MELANOLEUCA DRYOPHILA Murr., Mycologia 5: 217, 1913. Type.

Spores $5.5-7.5 \times 3.5-5.5\mu$, subglobose to broadly ellipsoid, with a small hilar depression, smooth, rather thin-walled; *gill-trama* regular; *hyphae of the epicutis* parallel, $4-11\mu$ thick, incrustated by colorless particles because of the mucilaginous mass in which they are imbedded. No clamp connections. Macroscopically very similar to *Collybia maculata*.

Conclusion: A species of the subgenus *Eu-Tricholoma*, very near to *Tricholoma resplendens* Lange, but under oak instead of conifers.

MELANOLEUCA EARLEAE Murr., N.A.F. 10(1): 18, 1914. Type.

Spores $9-12 \times 5.5-6.5\mu$, with none or with but slight hilar depression, with 0-1-many oil drops, ellipsoid, smooth, rather thin-walled, non-amyloid; *basidia* $32-55 \times 9-10\mu$; *hyphae of the epicutis* subparallel, slightly interwoven, cylindrical, $5-6\mu$ thick, thin-walled but with a thick colorless incrustation. No clamp connections.

Conclusion: A species of the genus *Tricholoma*.

TRICHOLOMA NIVEIPES Peck, Bull. Torrey Bot. Club **29**: 69, 1902. "Typical" collection from Mass. (S. Davis).

Spores cylindrical, $7-9 \times 3\mu$, thin-walled, smooth, multi-guttulate, non-amyloid; *basidia* $32-37 \times 5.5-6.2\mu$, 2-spored (all?); *cystidia* none; *gill-trama* regular, consisting of very thin ($1-1.5\mu$), non-amyloid hyphae; *hyphae of the epicutis* subparallel-interwoven ($1-2-5(-6)\mu$) and with neither any pigment nor any clamp connections.

Conclusion: A very distinct species of the subgenus *Eu-Tricholoma*. A collection of Murrill (determined as *Melanoleuca niveipes* by Murrill) does not belong here but to *Laccaria trullisata* (Ell.) Peck.

TRICHOLOMA ACERBUM Fr. sens. Bres., Icon. Mycol. **2**: 58, 1927. Authentic: Coll. and det. by Bresadola.

Spores $7 \times 5\mu$, broadly ellipsoid, smooth, non-amyloid; *hyphae of the epicutis* subparallel-interwoven, $3-10\mu$ thick, with incrusting membrana-pigment; no clamp connections.

Conclusion: A species of the subgenus *Eu-Tricholoma*.

MELANOLEUCA ARENICOLA Murr., Mycologia **5**: 214, 1913. Type.

Spores $4.5-5.5 \times 3\mu$, ellipsoid, with 1 oil drop, with hilar depression, hyaline, non-amyloid, smooth; *basidia* $17 \times 6\mu$; *gill-trama* regular; *hyphae of the epicutis* truly parallel, $7.5-11.5\mu$ broad, with a rather pale incrusting pigment. Surface of the pileus macroscopically fibrillose like an *Inocybe*.

Conclusion: A species of the subgenus *Eu-Tricholoma*, near *Tricholoma imbricatum* and *albobrunneum*.

TRICHOLOMA SUBSEJUNCTUM Peck, Bull. N. Y. St. Mus. **157**: 53, 1912. "Fragments of Albany types."

Spores $6-6.5 \times (3-)4.8-5.2\mu$, hyaline, smooth, non-amyloid; *basidia* $27-33 \times 6-7.5\mu$; *hyphae of the epicutis* about 6μ thick, incrusting by a brown membrana-pigment within certain spotlike spaces, strongly parallel, without clamp connections.

Conclusion: A species of the subgenus *Eu-Tricholoma*.

AGARICUS (TRICHOLOMA) TRANSMUTANS Peck, Ann. Rep. N. Y. St. Mus. **29**: 38, 1878. Authentic material from Stow, Mass. (S. Davis).

Spores $(5-)7-7.5 \times (4-)5\mu$, broadly ellipsoid, smooth, hyaline, non-amyloid; *basidia* $28-37 \times 7.5\mu$, 4-spored; *cystidia* none; *gill-trama* regular; *hyphae of the epicutis* parallel to subparallel-interwoven with incrusting pigment, cylindrical, $5-10\mu$ thick, without clamp connections. NH_3 gives a characteristic reaction with the dried specimens: The surface of the pileus and the stipe turns quickly to an intense chestnut brown.

Conclusion: A species of the subgenus *Eu-Tricholoma*, near to *Tricholoma flavobrunneum*. My corresponding data for this latter species are (exsiccata of Lundell & Nannfeldt): *Spores* 6-7.5 \times 4-5.7 μ , broadly ellipsoid, sometimes subglobose or simply ellipsoid, smooth, hyaline, non-amyloid, with 1 oil drop; *basidia* 26-30 \times 6.5-9 μ , 2- and 4-spored; *gill-trama* regular; *hyphae of the epicutis* parallel, 2.5-5 μ thick, incrusting by a red-brown pigment; no clamp connections. Thus the only microscopical difference consists in the diameter of the hyphae of the cuticle. I am not sure if this character is constant, and it is rather difficult to compare exactly corresponding stages of development.

MELANOLEUCA SUBTRANSUTANS Murr., N.A.F. 10(1): 22, 1914. Type.

Spores 5.6-6.8(-8) \times 3-4 μ , ellipsoid, smooth, hyaline, with hilar depression and attenuate towards the upper end, thin-walled; *basidia* 23-30 \times 6 μ ; *gill-trama* regular; *hyphae of the epicutis* subparallel, 5-10 μ thick, with incrusting pigment, without clamp connections. NH_3 reaction like the reaction of the preceding species.

Conclusion: A species of the same group as the preceding one, but distinct. The taxonomy of this group becomes still more complicated when we consider the existence of one more species which seems to be distinct from *Tricholoma transmutans* and *subtransmutans*. One specimen of this third species was determined as *Melanoleuca transmutans* by Murrill and collected by Burke in Montgomery County, Alabama, probably (according to the plant-remnants) in deciduous woods. The color of the pileus is incarnate brownish (not intensely red-brown), the NH_3 reaction is slow and not clear and the top of the stipe is adorned by white scales. The micro-characters are the same as in *Tricholoma transmutans*.

TRICHOLOMA SUBACUTUM Peck, Ann. Rep. N. Y. St. Mus. 42: 112, 1889.

Authentic: Coll. and det. by Peck.

Spores 7-8.5(-9) \times 4.5-5(-7) μ , ellipsoid, hyaline, rarely brownish, smooth, often multiguttulate, non-amyloid; *basidia* 32 \times 8-9 μ , 4-spored; *hyphae of the epicutis* 5-8 μ thick, subparallel, incrusting by a membranous pigment, without clamp connections.

Conclusion: A species of the subgenus *Eu-Tricholoma*, near to *Tricholoma virgatum*.

MELANOLEUCA FUMOSELLA Murr., N.A.F. 10(1): 28, 1914. Type.

Spores 5-5.8 \times 3-3.8 μ , ellipsoid with hilar depression, non-amyloid; *hyphae of the epicutis* parallel or slightly interwoven.

Conclusion: This species is not distinct from *Tricholoma dryophilum*.

MELANOLEUCA TENUPIES Murr., Mycologia 5: 223, 1913. Type.

Spores 6-9 \times 4-5.4 μ , smooth, hyaline, non-amyloid; *basidia* 26-37 \times 7-9 μ ,

gill-trama regular; *hyphae* of the *epicutis* 4–8 μ thick, with incrusting pigment in some places absolutely parallel, but in others running vertically or obliquely, and occasionally branching.

Conclusion: It is surprising that this small, slender fungus turns out to be an actual *Eu-Tricholoma*.

MELANOLEUCA STRIATELLA Murr., *Mycologia* 5: 221, 1913. Apparently the type.

Spores cylindrical or ellipsoid, nearly smooth or smooth, hyaline, non-amyloid, 5.5–7.8 \times 3–4.2 μ ; *basidia* 35–47 \times 5–6 μ ; *cheilocystidia* scattered, small, 25 \times 4 μ . Pigment-incrustation of the surface-hyphae almost lacking and no clamp connections are present.

Conclusion: Probably a species of the subgenus *Eu-Tricholoma*.

TRICHOLOMA ATROCINEREUM (Pers.) Fr. sens. Bres., *Icon. Mycol.* 2: 87, 1927. Coll. and det. by Bresadola.

Spores 6–7 \times 3.8–4.5 μ , smooth, hyaline, non-amyloid; *basidia* 30 \times 6.8–7.7 μ , 4-spored; *gill-trama* consisting of large, broad cells, and intermixed, non-amyloid; *epicutis* consisting of sphaerocystes of 20–40 μ diameter; *hyphae* of the cortex of the stipe 6–12(–20) μ thick, rather thick-walled, incrustated.

Conclusion: This species belongs to subgenus *Dermoloma* Lange which is distinguished from the species of *Calocybe* with cellulose epicutis (1) by the larger cells of the epicutis, (2) by the non-granular basidia, (3) by the absence of clamp-connections, and (4) by the presence of incrusting pigment which is never bright colored.

Gen. TRICHOLOMOPSIS Sing. (1939)

TRICHOLOMA RADICATUM Peck, *Bull. N. Y. St. Mus.* 67: 22, 1903. North Elba, N. Y., coll. and det. by Peck.

Spores 6–7 \times 3.5–5 μ , ellipsoid to very broadly ellipsoid, hilar depression more or less clear, with 0–1-numerous droplets, smooth, non-amyloid; *basidia* 25–32 \times 5–6 μ ; edge of the *lamellae* heteromorphous; *cheilocystidia* clavate or bottle-shaped, sometimes forking, very variable, thin-walled, 22–35 \times 5–9 μ ; *hyphae* sometimes rather thick-walled and regular in the gill-trama, irregular-interwoven in the cutis, the free hyphal ends cylindrical or clavate to subfusoid, 30–160 \times 11–35 μ , filled with a dissolved intracellular pigment. On the surface of the stipe is a layer of rather intermixed thicker hyphae. Clamp connections frequent, but not all septae show them. The *stipe* of the dry fungus is hollow.

Note: The data on the gill-edge was taken not from the type but from an identical collection of Morris, 1909, Amesbury, Mass.

Conclusion: This species is the second known to belong to the section

Platyphyllae of the genus *Tricholomopsis*. It is evidently related to *Tricholomopsis platyphylla*, but different. The combination ***Tricholomopsis radicata*** (Peck) Singer comb. nov. is proposed.

MELANOLEUCA SECEDIFOLIA Murr., Mycologia 5: 221, 1913. A collection from Salem, Ore., coll. Peck (type?).

Spores 8.5–9.5(–12) \times 6–6.7 μ , smooth, hyaline, non-amyloid, moderately thick-walled with a simple membrana, without hilar depression; *basidia* 29–51 \times 8.5–13 μ , often with irregularities (e.g. 1-spored with a 15 μ long sterigma or 2-spored with two 10.5 μ long sterigmata) mostly 4-spored; *cystidia* none, but with some basidium-like sterile bodies on the sides of the lamellae; edge nearly heteromorphous because of numerous cheilocystidia (35–60 \times 6.8–19.5 μ); *hyphae* of the regular gill-trama slightly interwoven; *hyphae of the cuticle* interwoven, repent, thin-walled, smooth, 2.5–6 μ thick, with clamp connections. Deep on the *stipe* a volva-like formation is seen which, however, since it is not mentioned in the original description, may be an incidental phenomenon that results from the breaking of the *stipe*.

Conclusion: This plant must be a species of *Tricholomopsis*, as the cheilocystidia and clamp connections separate it clearly from *Tricholoma*. It is however singular in growing on the soil (if it really does).

AGARICUS (TRICHOLOMA) FLAVESCENS Peck, Bull. Buffalo Soc. Nat. Sci. 1: 42, 1873. Type.

Spores 7–7.5 \times 5–6 μ , broadly ellipsoid without hilar depression, rather thin-walled, smooth or very rarely very slightly rough (?), non-amyloid; *basidia* 35–45 \times 7–8 μ , 4-spored; *cheilocystidia* bottle-shaped to fusoid with a 3.5–4 μ broad cylindrical neck which sometimes is yellow-incrusted, 40–105 \times 4.5–8 μ ; *hyphae of the cuticle* much interwoven, 3–8 μ thick, none of them erect, all with rounded ends; *clamp connections* frequent; *pigment* intracellular.

Conclusion: A good species of *Tricholomopsis*.

Gen. LYOPHYLLUM Karst. (1881) em.

CLITOCYBE ELEPHANTINA Murr., N.A.F. 9(6): 405, 1916. Type.

Spores globose, 6–8 μ in diameter, rather thin-walled, non-amyloid; *basidia* 35–39 \times 9 μ , 4-spored, with carminophilous granulation.

Conclusion: A species of *Lyophyllum*, very near to *Lyophyllum aggregatum*.

CLITOCYBE TENEBRICOSA Murr., Mycologia 7: 275, 1915. Type.

Spores globose, sometimes subangular with rounded angles, 6 \times 5 μ , rather thin-walled and non-amyloid; *basidia* 30 \times 8 μ .

Conclusion: This plant belongs to *Lyophyllum* but is probably only a variety or form of *Lyophyllum aggregatum*.

MELANOLEUCA SUBMULTICEPS Murr., Mycologia 5: 221, 1913. Type.

This plant is a true *Lyophyllum* of the *Aggregatum*-group, very near to the two preceding species.

TRICHOLOMA FULIGINEUM Peck, Ann. Rep. N. Y. St. Mus. 41: 60, 1888.

Marked as "typical"; from the type locality.

Spores $7-10 \times 4-5.3\mu$; *basidia* $25 \times 6.5\mu$ and larger, with carminophilous granulations; *gill-trama* regular, now more or less brownish, and with *hyphae* $4-8\mu$ thick; *clamp connections* frequent.

Conclusion: This species belongs to the genus *Lyophyllum*, therefore, the new combination ***Lyophyllum fuligineum***(Peck) Sing. is proposed.

Gen. CALOCYBE Kühner (1938)

TRICHOLOMA ONYCHINUM Fr. sens. Bres. Icon. Mycol. 3: 101, 1928. Coll. and det. by Bresadola.

Cells of the surface layer of the pileus $10-20 \times 6-20\mu$; *clamp connections* present.

Conclusion: This is the same species as *Calocybe onychina* (Fr.) Kühn.

AGARICUS (TRICHOLOMA) FALLAX Peck, Bull. Buffalo Soc. Nat. Sci. 1: 44, 1873. From Albany types, preserved at the N. Y. Botanical Garden, and authentic material from the Burt Herbarium, preserved at the Farlow Herbarium.

Spores $3.8 \times 2\mu$; *cells* of the surface layer of the pileus $10 \times 6.5\mu$ and smaller. The dried fruit bodies show only a faint tendency of blackening.

Conclusions: This species is a *Calocybe*, and therefore the combination ***Calocybe fallax*** (Peck) Singer comb. nov. is proposed. This species was observed also in the Altai Mountains, in central Asia, where it shows a much more pronounced tendency to blacken in dried condition.

Gen. CANTHARELLULA Sing. (1936)

CLITOCYBE OREGONENSIS Murr., Mycologia 5: 211, 1913. Type.

Spores $5-9(-10) \times 3.5-5(-5.5)\mu$ mostly $7.8 \times 4.4\mu$, ellipsoid with hilar depression, smooth hyaline, amyloid; *basidia* $32-42 \times 8-10\mu$, 4-spored, the *sterigmata* 9μ long; *cystidia* and *cheilocystidia* none; *gill-trama* regular; the *hyphae* parallel, $5-10\mu$ thick, without clamp connections.

Conclusion: This is the same species that I found repeatedly in the Northern Altai, Siberia. My notes on this plant follow:

Pileus subfuscous, sordid-greyish, avellaneous, hygrophanous, glabrous, with faintly striate margin, convex with depressed center and often with a

very small papilla within the depression, 17 mm. broad; *lamellae* pale greyish, rather narrow, rather thick, irregularly subsinuate and shortly decurrent, subdistant; *spores* $7.5-9 \times 3.8-4.3\mu$, mostly $8 \times 4\mu$, ellipsoid with hilar depression, smooth, hyaline, amyloid; *basidia* $35-39 \times 6.6-7.8\mu$; *cystidia* and *cheilocystidia* none; *gill-trama* regular; *stipe* dirty greyish, pale watery greyish, dirty brownish towards the base, equal, scarcely innate-fibrillose, glabrous, smooth, solid, $45 \times 3-4$ mm.; *context* hygrophanous; *odor* none; *hyphae* without clamp connections.

This species is very near to *Cantharellula cyathiformis* (Bull.) Sing. from which it differs by smaller spores and smaller size, and to *Cantharellula obbata* (Fr.) Bouss. from which it differs by narrower spores and paler colors. The combination **Cantharellula oregonensis** (Murr.) Singer comb. nov. is proposed.

CLITOCYBE ECTYPOIDES (Peck) Sacc. Syll. 5: 169, 1887. Authentic material: "teste Peck."

Spores cylindrical or ovoid-cylindrical and attenuate from the broadest part in the lower third towards the upper end, with a light hilar depression, or only with a hilar applanation, hyaline, amyloid, smooth, $(7-10(-11) \times 4-4.8\mu$; *basidia* $35-45 \times 8-9\mu$; *cystidia* none; *gill-trama* regular; *hyphae of the cuticle* parallel, radially arranged, $3-9\mu$, mostly about 6μ thick, with incrusting membrana-pigment; *clamp connections* frequent; *tomentum* of the stipe consisting of hyaline, smooth, multiseptate, cylindrical hyphae with numerous clamp connections.

Conclusion: This species connects the two essential groups of *Cantharellula* without being very near to any of them. It has the pigment-incrusted parallel radial hyphae of *Cantharellula cyathiformis* and the clamp connections of *Cantharellula umbonata*. *Cantharellula cyathiformis* is often met with on logs and stumps and the spore shape of *ectypoides* is the typically cylindrical one of this genus. The stipe is solid and subfibrillose and the lamellae forking as in other species. It is uncontestably a good species but Murrill says "Apparently not distinct from *Omphalia chrysophylla*." But *Omphalia chrysophylla* (recte *Armillariella chrysophylla*) which has usually darker yellow lamellae, never clamp connections, constantly non-amyloid and much broader, yellowish spores, is distinctly different. I checked also American material as I supposed that the American conception of *Omphalia chrysophylla* might differ from the European one. However, Murrill's material of this species from Virginia belongs to the European species.

Other American species of *Cantharellula* are: *Cantharellula umbonata* (Gmel.) Sing., *dryophila* (Zeller) (according to the co-type, preserved at the N. Y. Botanical Gardens without a description).

The combination **Cantharellula ectypoides** (Peck) Sing. comb. nov. is proposed.

MELANOLEUCA PORTOLENSIS Murr., Mycologia 5: 219, 1913. Type.

Spores $5.5-7.8 \times (3.5)4-4.3(-5)\mu$, ellipsoid, with a very slight hilar depression, very thin-walled, hyaline, very slightly but unquestionably amyloid, smooth or seemingly very slightly undulate, only internally granulate or with one central oil-drop and then perfectly smooth; *basidia* $27-36 \times 5.3-7\mu$; *cystidia* none; *gill-trama* regular with rather thick hyphae; *hyphae of the cuticle* of different size ($2.3-21\mu$ thick), repent, irregularly interwoven, smooth, often with clavate ends, with clamp connections, rather thin-walled (diameter of the membrane up to 1μ).

Conclusion: It is rather difficult to find out the taxonomic position of this badly preserved specimen. There is no veil visible now. Judging from the microscopical analysis this species may be near *Cantharellula*, *Armillaria*, or *Leucopaxillus*, but further observation on fresh material is needed.

Gen. MELANOLEUCA Pat. (1900)

CLITOCYBE EARLEI Murr., Mycologia 7: 261, 1915. Type.

Spores about $(7)-9-(10) \times (3.8)-5-(6.3)\mu$, warty-punctate, narrow-ellipsoid or ellipsoid, amyloid, with smooth hilar spot; *basidia* $42-46 \times 9.5\mu$, 4-spored; *cystidia* fusoid or subulate or bottle-shaped, $60-95 \times 11-19\mu$, very numerous; *hyphae of the gill-trama* 5μ in diameter. No clamp connections seen.

Conclusion: This plant has all characters typical for *Melanoleuca*; rough amyloid spores with hilar spot, cystidia, no clamp connections. The combination **Melanoleuca Earlei** (Murr.) Sing. comb. nov. is proposed.

MELANOLEUCA PRAECOX Murr., N.A.F. 10(1): 20, 1914. Type.

Spores $7-8 \times 5-6\mu$, ellipsoid, hyaline, amyloid with isolated, coarse warts, with hilar depression and smooth hilar spot; no *cystidia* found; *hyphae of the cuticle* subparallel-interwoven, $6-12\mu$ thick, smooth. Clamp connections lacking.

Conclusion: It is known that some individuals and also some species of *Melanoleuca* do not show any cystidia. They have however all other characters of this genus and are inseparable from it. Murrill's *Melanoleuca praecox* belongs actually to this genus in the sense of Patouillard.

TRICHOLOMA MIRABILE Bres., Fung. Trid. 1: 16, pl. 17, 1882. Authentic: coll. and det. by Bresadola.

Spores $9-10 \times 5.5-6.5\mu$, amyloid, smooth to slightly rough but with an evident hilar spot and with internal granulation; *basidia* $33-42 \times 9-10\mu$; *cystidia* none.

Conclusion: This really "mirabilis" species is a *Melanoleuca*, **Melanoleuca mirabilis** (Bres.) Sing. comb. nov. It is very rare in Europe and its

veil seems to be not constant. It is the only veiled species in this genus, as *Melanoleuca verrucipes* (Fr.) Sing. has no actual veil, only black, scabrous scales like *Trachypus* in the *Boletaceae* or *Hygrophorus pustulatus*. It has been previously shown by the writer (Revue de Mycologie 1: 40, 1936) that some species of *Melanoleuca* have smooth or nearly smooth spores.

AGARICUS (COLLYBIA) DEHISCENS Kalchbr., Revue Mycologique 4: 95 (tab. 29, 1) 1882. Part of type.

Spores $9.4-10.2 \times 6.3-6.8\mu$, rather thick-walled (but membrana simple), with smooth hilar spot, faintly punctate because of strongly amyloid points or spots which do not project to the outer level of the membrana; *basidia* $28 \times 10.8\mu$; *cystidia* not seen, but possibly present in other specimens; *hyphae* of the surface of the pileus interwoven, without clamp connections. The pileus seems to have been whitish.

Conclusion: A good species of *Melanoleuca* characterized by the non-projecting ornamentation and the thick spore-walls. The combination **Melanoleuca dehiscens** (Kalchbr.) Sing. comb. nov. is proposed.

COLLYBIA SEDULA Graff, Bull. Torrey Bot. Club 62: 218, pl. 13, fig. 3, 1935. Type: specimen from which Fig. 3 was drawn.

Spores $8.5-10 \times 4.3-5\mu$, amyloid with isolated warts, with smooth hilar spot; *basidia* $26-34 \times 8.5-9.5\mu$; *cystidia* $40-100 \times 9-16\mu$, subulate, tapering almost from the base, with the characteristic cristalline apex, numerous on the sides and edges of the lamellae. Clamp connections lacking.

Conclusion: I have already transferred this species to *Melanoleuca* (Revue de Mycologie 1: 282, 1936).

MELANOLEUCA SUBCINEREIFORMIS Murr., N.A.F. 10(1): 28, 1914. Type.

Spores $8-9.5 \times 4-5\mu$, ellipsoid, with prominent isolated amyloid warts and smooth hilar spot; *basidia* $30-32 \times 7-9\mu$; *cystidia* fusoid and often elongated into a long neck and thus bottle-shaped, most of them with a big cristal-top above, $65 \times 6-10\mu$, projecting part 22μ long. *Trama* of the lamellae regular. *Hyphae* without clamp connections.

Conclusion: All characters prove that it is a real *Melanoleuca*.

Gen. XEROMPHALINA Kühn. & Maire (1935)

OMPHALIA KALCHBRENNERI Bres., Fung. Trid. 1: 32, pl. 35, fig. 1, 1883. Authentic: coll. and det. Bresadola.

Spores $7-10 \times 4.5-4.8\mu$, faintly amyloid, ellipsoid, with hilar depression, smooth, thin-walled; *basidia* $30-35 \times 7-9.5\mu$; *cheilocystidia* very scattered and not striking, clavate-filamentose, 3μ thick; *gill-trama* regular, non-amyloid; *epicutis* like the following species; *clamp connections* present.

Conclusion: This species is almost equally near to *Leucopaxillus* and

Xeromphalina. As it has more the general appearance of an *Omphalia* and the narrower spores of *Xeromphalina*, and cannot be compared with the mostly remarkably fleshy stout species of *Leucopaxillus*, I prefer to place the dividing line between these two genera so that *Omphalia Kalchbrenneri* falls into *Xeromphalina*. The relation between *Leucopaxillus* and *Xeromphalina* is analogous to the relation which exists between *Armillariella* and *Omphalia*. Thus, the new combination ***Xeromphalina Kalchbrenneri*** (Bres.) Sing. becomes necessary. *Omphalia graveolens* Pet. (1907) must be identical inasmuch as Kühner and Maire found amyloid spores.

CLITOCYBE FARINACEA Murr., N.A.F. 10(6): 401, 1916. Type.

Spores 6-8×3.5-4.5μ, hyaline, amyloid, smooth, multiguttulate, ellipsoid, with hilar depression; *basidia* 22-30×5-6μ, 4-spored; *cheilocystidia* lacking or not striking; *cystidia* none; *gill-trama* regular; *hyphae of the cuticle* regularly and radially arranged with no or very faint pigment incrustation, narrow, but some thickened and subvesiculose; *hyphae of the stipe* thin-walled, 2-5μ thick. All hyphae non-amyloid, with clamp connections. The dried specimens look like a *Tubaria*.

Conclusion: This is an American form of the preceding species. It is distinguished by a little smaller spore. *Omphalia graveolens* Pet. from Europe has also smaller spores than *Kalchbrenneri* and the spores of other species of *Xeromphalina* are very variable, the size depending often on the size and stage of development of the fruit bodies. Another collection of Murrill, determined "near *Clitocybe fellea* Peck, but not" and belonging certainly here, has still smaller spores that are 5-6.5×3-4μ, and basidia which measure 18-30×5μ. But all these specimens are young and this is evidently the reason for the smaller spores.

The genus *Xeromphalina* may be divided into three groups:

- (1) *Graveolentes*. Odor farinaceous. Reaction of trama with NH₃: -; of trama with iodine: -. *X. Kalchbrenneri*.
- (2) *Campanellae*. Odor not farinaceous. Reaction of trama with NH₃: - or +; of trama with iodine: -. *X. campanella*, *cauticinalis* (Cornui), *orickiana*.
- (3) *Intermediae*. Odor not farinaceous. Reaction of trama with NH₃: -; of trama with iodine: +. *X. intermedia*.

Gen. COLLYBIA Fr. (1821 ut tribus Agarici)

MELANOLEUCA COLLYBIIFORMIS Murr., Mycologia 5: 216, 1913. Type.

Spores 3.8-4.5×3-3.7μ, globose, hyaline, non-amyloid, smooth; *basidia* 20×5μ; *basidioles* (or *cystidioles*?) fusoid as in *Marasmius*; *gill-trama* regular, *hyphae* 1.5μ in diameter, non-amyloid; *pileus* with strongly interwoven surface-hyphae, with incrusting brown pigment, which macroscopically turns dark brown to black in NH₃; *lamellae* denticulate.

Conclusion: "This species is closely related to some species of *Collybia*." Murrill l.c. p. 217. It is actually very closely related to *Collybia distorta* Fr. but may be distinct because of the smaller spores. The new combination ***Collybia collybiiformis***, although not very expressive, must be made.

COLLYBIA PINETORUM All., Bot. Centr. 4: 313, 1888. Type.

As Bresadola mentioned correctly, this species is nothing but a synonym of *Collybia distorta*.

MELANOLEUCA PINICOLA Murr., Mycologia 5: 219, 1913. Type.

Spores $4.3-5.3 \times 2.2-2.5\mu$, ellipsoid with hilar depression, hyaline, non-amyloid, smooth; *basidia* $25 \times 4.5-5\mu$; *cystidia* none; *pileus* with an intermixed-interwoven surface-layer, the thinner filamentous hyphae with acute ends; *tomentum* of the base consisting of fasciculate filamentous hyphae of $1.5-4\mu$ diameter; *hyphae* with clamp connections. With NH_3 no reaction observed.

Conclusion: The type of *Melanoleuca pinicola* belongs to the genus *Collybia* and is a good species, distinct from *Collybia leucocephaloides* and *maculata*. The combination ***Collybia pinicola*** (Murr.) Sing. comb. nov. is proposed.

TRICHOLOMA LEUCOCEPHALOIDES Peck, Ann. Rep. N. Y. St. Mus. 49: 16, 1897. Authentic material, coll. by Peck at North Elba.

Spores $5.5-7 \times 3.2-4.2\mu$, ellipsoid, hyaline, multiguttulate, smooth, thin-walled, non-amyloid; *basidia* $28-35 \times 6-7\mu$; *cystidia* none; *hyphae* of the surface layer of the pileus hyaline, smooth, thin-walled, $2.5-6\mu$ thick, cylindrical, irregularly interwoven, with clamp connections.

Conclusion: This species is a *Collybia*. *Collybia leucocephala* Bres. (non Fries which is understood in the sense of Lange) is identical or very closely related. I compared my numerous notes on European material including specimens from Bresadola's Herbarium. The only differences are that dried fruit-bodies of *Tricholoma leucocephaloides* have a more dull brownish tint and moderately close lamellae, while the European plant tends more to yellowish, and has very close lamellae.

The combination ***Collybia leucocephaloides***(Peck) Sing. comb. nov. is proposed.

MELANOLEUCA UNAKENSIS Murr., N.A.F. 10(1): 14, 1914. Type.

Spores $6-7.5 \times 3.5-3.8\mu$, almost ovoid, non-amyloid; *basidia* $24-26 \times 3.2-5.5\mu$; *cystidia* none; *hyphae* of the surface layer of the pileus irregularly interwoven, smooth, hyaline, $4-5\mu$ thick, with clamp connections. There is no reaction with NH_3 . A specimen which is erroneously marked as type of *Melanoleuca pinicola* has similar characters; *spores* $5.2-6.4 \times 3.2-4\mu$, thin-walled, non-amyloid; *basidia* $25-29 \times 6\mu$; *gill-trama* regular, non-amyloid;

hyphae of the tomentum of the base about 3μ thick, fasciculate, often undulate, with clamp connections; *stipe* fistulose; *base* attenuate and acute with a strong tomentum within the substratum; *lamellae* denticulate.

Conclusion: This species is probably identical with the preceding species but comes nearer to the European form.

Thus, there are four species of the *Maculata*-group (*Rhodocollybia*¹³) in U.S.A.: *Collybia collybiiformis*, *pinicola*, *leucocephaloides* and *maculata*. The typical spotted *Collybia maculata* from northern Europe has spores $6.2-(7.5) \times 4.8-5-(5.3)\mu$ in size, and a specimen from Massachusetts (determined as *Melanoleuca pinicola* by Murrill) has spores $5.3-6 \times 4-5\mu$ with a small hilar depression and basidia $22-36 \times 6-8\mu$; ferruginous spots none (var. *immaculata* Cooke). This is only a form of *Collybia maculata* whose typical spotted form is also frequent in many parts of North America.

MELANOLEUCA MEMMINGERI Murr., N.A.F. 10(1): 13, 1914. Type.

Spores $5-6 \times 4-5.3\mu$, globose, non-amyloid, smooth. *Base* with a tomentum whose fasciculate hyphae are $1-4.5\mu$ thick and have clamp connections.

Conclusion: I obtained no clear results with the carmine-reaction of the basidia and no spore print exists. I suppose however that this species belongs to *Collybia* in spite of the unusual size.

MELANOLEUCA EDURIFORMIS Murr., N.A.F. 10(1): 18, 1914. Type.¹⁴

Spores $4-5.5 \times 2.2-3\mu$ (*eduriformis**); $6-8.3 \times 2.5-3.5\mu$ ("*subedura*"), ellipsoid to ellipsoid-oblong or cylindrical-ellipsoid, hyaline, smooth, with hilar depression, with 0-1-numerous droplets, non-amyloid; *basidia* $21-35 \times 4-5\mu$, 4-spored; *cheilocystidia* and *cystidia* none; *gill-trama* non-amyloid, regular; *cuticle* of the pileus dense and hyphae thinner than in the subjacent pileus-trama, macro- and microscopically glabrous. *Clamp connections* in general lacking; I found only two dubious ones.

Conclusion: Probably a *Collybia* in spite of the clamp-less septa which may be explained by parthenogenetic development of the one mycelium in question.

Gen. MARASMIUS Fr. (1836) em. Sing.

COLLYBIA FIMICOLA Earle, Bull. N. Y. Bot. Gard. 3: 298, 1904. Type.

Spores $6.3-8.8 \times 4-4.3\mu$, ellipsoid to fusoid-ellipsoid, with hilar depression, non-amyloid, smooth, with 0-1-numerous oil drops, thin-walled; *basidia* $36-41 \times 6-10\mu$, 2-spored (all?), without carminophilous granulation; *gill-trama* regular, subintermixed, amyloid; *epicutis* of the pileus—a

¹³ *Rhodocollybia* is perhaps rather a subgenus than a genus, including all pinkish cream spored species, i.e. the majority of the Friesian section *Striipedes* (*buthyracea*, *maculata*, etc.)

¹⁴ The type is erroneously marked as "*Melanoleuca subedura* n. sp. Aug. 29, 1911," but there is one other specimen, labeled correctly, and probably part of the same collection, but not marked as type.

layer of subsphaeroid to clavate cells of $10-16 \times 6.5-10\mu$; *clamp connections* present.

Conclusion: This species is significant because Earle made *Collybia fimicola* the type of his genus *Tephrophana* (1909), accepted by Kühner in 1938. I do not think that this genus in the conception of Kühner is needed at all, the species included being only small *Lyophylla*. But if the genus nevertheless is used, it can not bear the name of *Tephrophana*, as *Collybia fimicola*, on which it is based, is a *Marasmius* of the section *Globulares* Kühn. and belongs to the *Oreades*-group. It is probably identical with *Marasmius albogriseus* (Peck) Sing.

COLLYBIA COLLINA (Scop.) Fr. sens. Bres. Icon. Mycol. 5: 208, 1928.

Authentic: coll. and det. by Bresadola.

Spores $7.7-10.2 \times 4.2-4.3\mu$, subfusoid to subrhomboid, smooth, non-amyloid, hyaline; *epicutis* consisting of more or less erect, clavate hyphae, arising from the strongly interwoven hyphae of the pileus trama which are distinctly amyloid.

Conclusion: *Collybia collina*, apparently not only in the sense of Bresadola, but of most authors including Scopoli and Fries belongs to *Marasmius*, sect. *Globulares* Kühn. I observed it with Dr. Codina at La Salut, Catalonia, Spain, where it grows with *Marasmius oreades*. The combination ***Marasmius collinus*** (Scop.) Sing. comb. nov. is proposed.

Gen. FAYODIA Kühn. (1936) em. Sing.

AGARICUS (CLITOCYBE) APERTUS Peck, Ann. Rep. N. Y. St. Mus. 30: 38, 1878. Part of the Albany types.

Spores $5.6-6.7 \times 4-5\mu$, smooth, amyloid, very broad ellipsoid; *basidia* $4.8-5.3\mu$ in diameter, 4-spored; *cystidia* not seen; *gill-trama* regular with filamentose hyphae; *hyphae of the cuticle* regular and radial.

Conclusion: A *Fayodia* of the *Lacerata*-group.

COLLYBIA ABUNDANS (Peck) Sacc., Syll. Fung. 5: 241, 1887. Authentic: Specimens from Vermont, ex Herbario Burt, confirmed by Peck.

Spores $4-6 \times 3-4.3\mu$, subglobose, rather thick-walled, amyloid; *basidia* 6.5μ in diameter, 4-spored; *cystidia* none; *cheilocystidia* balloon- or sack-shaped or broadly cylindrical, hyaline, $35-53 \times 13-16.5\mu$.

Conclusion: If this really is the Peckian conception—and there is no reason to believe it is not—then Kauffman was certainly right in considering it distinct from *Collybia familia*. A specimen of Kauffman, collected near Ithaca, N. Y. is identical with the specimens of Burt. Both species belong to *Fayodia*, and therefore the new combination ***Fayodia abundans*** (Peck) Sing. is proposed.

COLLYBIA FAMILIA (Peck) Sacc., Syll. Fung. 5: 241, 1887. Material collected by Kauffman and determination confirmed by Peck.

This material is evidently identical with the material sent me by A. H. Smith and included in the genus *Baeospora* by me (see *Revue de Mycologie* 3: 193, 1938). There is, however, a continuous series of forms running from *Collybia familia* to *Fayodia lacerata*: (1) *familia*, (2) spec. aff. *familia* and determined usually as *Collybia familia*, (3) *abundans*, (4) spec. ined. aff. *lacerata*, coll. E. V. Seeler, (5) *lacerata*. Consequently *Collybia familia* is more naturally ranged among *Fayodia* than among the *Baeospora*. Dr. Alexander H. Smith was the first suggesting the relation of *Collybia familia* and *lacerata* when we talked on the position of these species. As I see now in face of more material, he was perfectly correct. A survey of the collybioid genera with amyloid spores is given in this paper, p. 128.

CLITOCYBE ATRIALBA Murr., *Mycologia* 5: 207, 1913. Type.

Spores 10–12.5 × 8.5–9.5 μ , broadly ellipsoid to subglobose, thick-walled, amyloid, smooth; *basidia* 45 × 9 μ , 2-spored with *sterigmata* 9–10 μ long; *cystidia* (or monosporous basidia?) clavate-apiculate, 45 × 9 μ .

Conclusion: A good species of *Fayodia*: ***Fayodia atrialba*** (Murr.) Sing. comb. nov.

Gen. **Heimiomyces** gen. nov.

AGARICUS (COLLYBIA) RHEICOLOR Berk. & Curtis, Ann. Mag. Nat. Hist. 3: 376, 1839. Four collections from different localities in Brazil, sent by Rick to the Farlow Herbarium were compared with the types of the Curtis Herbarium and as a result the following description is given:

Pileus "cinnamon-rufous" or "tawny" (R.), later becoming more "chestnut brown" (R.), the spaces between the darker lines near the margin are lighter yellow, faintly velvety-pubescent but later glabrescent, broadly striate-sulcate, the thin margin initially incurved, venose-rugose in the center, convex, later umbilicate, 18–50 mm. broad; *epicutis* consisting of a subhymeniform layer of erect hairs which are clavate or divided like horns, 20–27 × 3–4.5 μ ; *hypoderm* 15–40 μ thick, consisting of large irregular hyphae with thick walls, brown, often looking like a parenchym, but the hyphae are elongated and interwoven. The pigment is a membrana-pigment incrusting the hyphal walls which have a diameter of at least 1 μ ; *lamellae* subconcolorous with the more yellowish interspaces of the margin of the pileus and with still paler edges, moderately broad, in average pilei not more than 2 mm. broad, close to moderately crowded, transversally veined at the base, often undulate, adnate to adnexed or subdecurrent, sometimes subventricose, tough; *spores* 6–7.5 × 3.3–4.5 μ , with slight hilar depression, ellipsoid, smooth, hyaline, amyloid; *basidia* 22–31 × 4.5–6.5 μ , often subamyloid at the tip; *cheilocystidia* similar to the hairs of the epi-

cutis (and homologous with them), somewhat bottle-shaped to forked, thick-walled, $2.3\text{--}5\mu$ broad at the base, $2\text{--}2.5\mu$ broad at the neck; *cystidioles* (or basidioles?) fusiform, acute, not projecting, numerous, $28\text{--}31 \times 2\text{--}5\mu$; *trama* interwoven-subintertexted; *hyphae* non-amyloid, very thick-walled (wall up to 4μ , lumen down to 1μ and less), $10\text{--}11\mu$ thick; *stipe* "Mars yellow" (R.) or "Raw sienna" (R.) or more rustbrown in later stages, woolly-velvety, slightly longitudinally striate, equal or slightly thickened to the base, often with a long pseudorhiza within the substratum, stuffed, $20\text{--}73 \times 3\text{--}4$ mm.; the hairs forming the velvet are thick-walled, often acute at the upper end, $5\text{--}8\mu$ thick; *context* very thin; *taste* and *odor* unknown to me; *hyphae* very thick-walled, hyaline, very irregularly interwoven, about 10μ thick, with clamp connections. *Hab.*: On dead frondose wood.

Conclusion: The characters of this species do not check with any known genus. They come nearest to *Baeospora* Sing. which however differs in many ways. As Roger Heim was the first mycologist to discuss the taxonomic position of this new world species, I propose for it the new genus:

Heimiomyces gen. nov. Cuticula subhymeniformi; hyphis crassotunicatis, fibuligeris; sporis hyalinis, ellipsoideis, aporis, amyloideis; cheilocystidiis numerosis; cystidiis nullis; trama lamellarum subintertexta, haud amyloidea; habitu consistentiaque marasmioideis. Stipite velutino, saepissime radicato. *Hab.* ad ligna. *Typus generis*: *Agaricus* (*Collybia*) *rheicolor* Bk. & Curt.

It is not known whether the species indicated as synonyms by Murrill actually belong here. It will be easy to state the identity or non-identity of the existing types of *Agaricus tenuipes* Schwein., *Marasmius rhabarberinus* Berk., *Marasmius amabilipes* Peck, *Agaricus cerinus* Morgan, *Agaricus* (*Collybia*?) *aurantiellus* Speg., now that the multitude of striking characters of *Agaricus rheicolor* is established.

The *Marasmioideae* with amyloid spores are now distributed in the following genera:

A. Hyphae not amyloid (faintly amyloid in some forms of *Fayodia*).

I. Dermatocystidia of the pileus absent or moderately differentiated and representing only the somewhat thickened free ends of epicutis-hyphae; some hairs may be present, but no palisade and no hymenium is seen on the pileus and epicutis-hyphae never diverticulate.

a.) Spores globose or subglobose or very broadly ellipsoid, \pm thin-walled. Pigments greyish brown to blackish. Lamellae adnate to decurrent. Context fleshy, even soft. *FAYODIA* Kühn. em. Sing.

b.) Spores ellipsoid to subcylindrical, thin-walled. Pigment ochraceous, alutaceous, tawny, brown, lilac-violaceous, etc.

1.) Lamellae decurrent, not very narrow, not very close. Spores rarely smaller than 5μ . (see B, II, b).

2.) Lamellae almost free, very narrow, very close. Spores rarely larger than 5μ *BAEOSPORA* Sing.

II. Dermatocystidia present and differentiated, and forming a hymeniform layer or at least a distinct epicutis on the pileus.

a.) Hyphae thin-walled. Lamellae tender. Dermatocystidia rather broad. Pigment greyish brown, umber, avellaneous, blackish. *HYDROPS* Kühn.

- b.) Context and even gill-trama consisting of extremely thick-walled hyphae. Lamellae tough. Elements of the epicutis narrow. Pigment tawny, etc. . . . *HEIMIOMYCES* Sing.
- B. Hyphae amyloid (except for some *Mycenae*).
- I. Epicutis cellular or consisting of diverticulate narrow radial hyphae, or cheilocystidia diverticulate. *MYCENA* Fr.
- II. Hyphae of the pileus not diverticulate nor globose. Cheilocystidia not diverticulate.
- a.) Spores globose, pseudoamyloid. Hyphae without clamp connections. Pigment violaceous. *Pseudobaeospora* Sing.¹⁵
- b.) Spores ellipsoid to subcylindrical, amyloid. Hyphae usually with clamp connections, only rarely (1 species) and then faintly amyloid. Pigment ochraceous, tawny, brownish, yellow, etc. *XEROMPHALINA* Kühn. & Maire.

Gen. *HYDROPUS* Kühn. (1938) em.

CLITOCYBE OCOLATA Murr. *Mycologia* 5: 207, 1913. Type.

Spores 11–15.5 × 6–9.4μ, with hilar depression, amyloid, multiguttulate; *basidia* 35–52 × 8–9μ; *cheilocystidia* not very striking, vesiculose or filamentose; *trama of the gills* non-amyloid, rather interwoven; *epicutis* subhymeniform, consisting of pigmented clavulae which sit on a regular hyaline hypoderm and are 30 × 12–15μ in size.

Conclusion: This species has nothing to do with *Clitocybe* but it is intermediate between *Mycena trichoderma* Kühn. which has a similar epicutis, and "*Omphalia*" *marginella*. As Kühner put the latter in his new "section or genus" *Hydropus*, *Clitocybe ocolata* may be called ***Hydropus ocolatus*** (Murr.) Sing. comb. nov., although the type of this group, *Hydropus fuliginarius*, is not yet satisfactorily studied and Kühner did not include *Mycena trichoderma* in his *Hydropus*.

Gen. *PANELLUS* Karst. (1879) em.

COLLYBIA RUPICOLA Mass., *Kew Bull.* No. 138: 114, 1898. Type.

Spores 5–6.6 × 1.5–2.7μ, cylindrical, smooth, amyloid; *basidia* tiny; *gill-trama* regular, thick, brown in NH₃ because of a dark ferruginous membrana-pigment, consisting of 3–6μ thick, parallel hyphae; *laticiferae* none; *hyphae* of the pileus-trama rather thick-walled; *cuticle* consisting of thick-walled brown, 3–6μ thick hyphae. Surface of the pileus like that of *Panellus stypticus* (Pers.) Karst. The stipe passes over into a brown branched stroma, and the stipe is extremely short and eccentric.

Conclusion: This species belongs to the genus *Panellus* and it is related to, but distinct from *Panellus stypticus* (Pers.) Karst. The new combination ***Panellus rupicola*** (Mass.) Sing. is proposed.

Gen. *LENTINELLUS* Karst. (1879) em. Fayod, Kühn.

TRICHOLOMA SEMIVESTITUM Peck, *Bull. Torrey Bot. Club* 22: 485, 1895.

Type (part of the type preserved at the N. Y. Botanical Garden).

¹⁵ Gen. nov. Characteribus *Baeosporae oligophyllae* Sing. *Revue de Mycologie* 3: 194, 1938.

Spores $5.3-6 \times 4\mu$, subglobose, strongly amyloid, rough, without smooth hilar spot; *basidia* $19 \times 5.4-6\mu$, 4-spored; *cystidia* none, but *pseudocystidia*¹⁶ clavate, with banded content and connected with the laticiferous elements of the gill-trama, $30-60 \times 6.5-7.7\mu$, rather numerous; *gill-trama* regular, non-amyloid; *basis-tomentum* consisting of an irregular texture of brown filaments; *hyphae* thick-walled, smooth, $2-3\mu$ thick; *clamp connections* present.

Conclusion: The genus *Lentinellus*, distinguished from *Lentinus* by the whole chemistry of the tissues of the fruit bodies, the form of the spores and their reaction with iodine, is much nearer to *Leucopaxillus* from which it evidently derived. It is distinguished by the more pleurotoid appearance and the presence of numerous laticiferae and pseudocystidia. This species has nothing to do with *Tricholoma*. The new combination **Lentinellus semivestitus** (Peck) Sing. is proposed. This species is interesting because it is the first representative of the genus described as growing on grass roots. There is however, a parallelism in other genera, e.g. in *Gymnopilus* = *Fulvidula*, where also most of the species grow on wood while *Gymnopilus flavus* (Bres.) = *Fulvidula flava* (Bres.) Sing. grows on grass roots. An analogous case is *Flammula graminis* (Quelet) Sing., among the *Flammulae* (cf. *Revue de Mycologie* 3: 239, 1937 and 5: 4, 12, 1940.)

Gen. LENTINUS Fr. (1836)

LENTINUS CUBENSIS Berk. & Curt., Jour. Linn. Soc. 10: 302, 1868. Type and other collections of Wright, and one collection of Bruce Fink from Bolivia, determined by Murrill as *Lentinula detonsa* (Fr.) Murr., all identical.

LENTINUS PROXIMUS Berk. & Curt., Jour. Linn. Soc. 10: 302, 1868. Co-type (#162).

Spores $4.2-5.8 \times 2.5-2.8\mu$, in form and other characters similar to the spores of *Lentinus edodes* (Berk.) Sing. (The type specimen has no spores but it is mouldy and there are plenty of globose spores, $3.3-4.7 \times 2.3-4\mu$, not belonging to the *Lentinus*); *basidia* $20-25 \times 4.2-4.5\mu$; *cystidioles* (or basidioles) fusoid $14.5-23 \times 4-4.5\mu$, very numerous; *cystidia* and *pseudocystidia* not seen, only some more hypha-like bodies of different shape, e.g. $16-24 \times 3-4.5\mu$; *hyphae* with clamp-connections.

Conclusion: A good species of *Lentinus*. All three species: *Lentinus cubensis*, *proximus* and *Lentinula detonsa* Murr. are identical. Whether *Lentinus detonsus* Fr. is really the same cannot be decided, although the locality and description of the latter suggest that it is the same, but an old stage.

¹⁶ Pseudocystidia are cystidia-like projections of the lactiferous system into the hymenium. They are characteristic for the genera *Russula*, *Lactarius*, *Lentinellus*, *Lactocollybia*. The term pseudocystidia was created by R. Kühner for the "cystidia" of *Lentinellus omphalodes*.

There is no good reason for splitting from the main genus *Lentinus* a monotype genus *Lentinula*. All decisive characters are the same in *Lentinus* and *Lentinula*.

Judging from Pilát's observations on *Lentinus cubensis* from the Wright Herbarium, one is tempted to believe he had a *Lentinellus*, but as the specimens were probably likewise infected by a mould, there is no other possibility than to assume that Pilát's spores do not belong to *Lentinus cubensis*. (Cf. Pilát, A. Revision der tropischen *Lentinus*-Arten aus dem Botanischen Museum in Berlin-Dahlem. Ann. Myc. 34: 114, 1936).

PANUS LEVIS Berk. & Curt., Ann. Mag. Nat. Hist. 2: (12): 427, 1853. Type.

PANUS STRIGOSUS Berk. & Curt., Ann. Mag. Nat. Hist. 3(4): 296, 1859.

Type.

The type of *Panus levis* and *Panus strigosus* were compared in the Curtis Herbarium (Farlow Herbarium) and were found to be really identical. A collection of fresh material from Purgatory Swamp, Mass., was equally compared with the type and the resulting description shows that this species does not belong to *Panus* because of the size of the spores and the lack of true cystidia of the *Panus*-type. This species is, as indicated by Murrill (but for other reasons), a species of *Lentinus* distinct from other species of the same genus because of the extraordinary structure of the hymenophores.

Pileus white, suborbicular, convex-umbilicate to almost plane or depressed, thin and more or less sulcate at the margin, up to 160 mm. broad, pilose-villous; the erect hairs consist of ropes of somewhat interwoven or subparallel hyphae which are 4-4.5 μ thick; *lamellae* white, but soon yellow, particularly when decaying, moderately close, with concave, entire edges, broad, decurrent; *spores* 8-10 \times 4-5 μ , cylindrical, hyaline, smooth, non-amyloid; *basidia* 27.5-32.5 \times 6.5 μ ; *hyphae* of the gill-trama thick-walled, 3-4 μ thick, interwoven, not distinct from the other trama hyphae; the *trama* layer is flanked by another layer on each side, consisting of hyphae with only very moderately thickened walls quite distinct from the tramal hyphae and forming an unusually thick subhymenium; none of the hyphae are amyloid; *stipe* white, strongly strigose-villous to the interspaces of the lamellae where they go over into the stipe, attenuate above or nearly equal, comparatively soft inside of a very tough-leathery cortex, sometimes very eccentric, solid, 50-110 \times 10-20 mm.; *context* white, thick, soft, tough; *hyphae* with clamp connections. In old and decaying fruit bodies the whole context and all surfaces become progressively bright yellow, first the lamellae and the margin of the pileus. There is almost no reaction with KOH, FeSO₄, aniline and phenol, and sulphovanilline gives only the ordinary pinkish protoplasma-reaction. *Hab.*: on a trunk of *Acer rubrum*, gregarious.

Gen. LIMACELLA Earle (1909)

MELANOLEUCA SUBPESSUNDATA Murr., Mycologia 5: 222, 1913. Type.

Spores $5-5.8 \times 4-4.8\mu$, subglobose, hyaline, non-amyloid, smooth, granular, without hilar depression; some of the spores are pseudoamyloid; *basidia* $32 \times 6\mu$; *hyphae of the mediostratum* few, parallel, cylindrical, non-amyloid, those of the hymenopodium ("lateral stratum") intermixed and large, e.g. $25 \times 22\mu$; *hyphae of the epicutis* repent, cylindrical, some obliquely erect and with clavate ends which are imbedded in a mucilaginous layer. All pigments intracellular. All hyphae with clamp connections.

Conclusion: The bilateral trama, the round small non-amyloid spores, and the presence of numerous clamp connections are decisive characters of the genus *Limacella*. The new combination ***Limacella subpessundata*** (Murr.) Sing. is proposed.

MELANOLEUCA SUBVELATA Murr., Mycologia 5: 222, 1913. Type.

Spores $5.3 \times 5\mu$, smooth, non-amyloid and non-pseudoamyloid; *basidia* $42 \times 6-7\mu$, 4-spored; *hyphae* of the evidently bilateral trama and of the veil (here they are cylindrical, $5-6(-8)\mu$ thick) with conspicuous clamp connections.

Conclusion: Comparing this species with the preceding one I found that there is no specific difference, the specimens of *Melanoleuca subvelata* being a little less developed than the type of *Limacella subpessundata* (Murr.) Sing.

Gen. LEPIOTA Fr. (1821 ut tribus Agarici)

AGARICUS (TRICHOLOMA) MICROSPORUS Ellis, Bull. Torrey Bot. Club 5: 45, 1874. Type.

Spores $4.5-5.2 \times 3.3-3.6\mu$, broadly ellipsoid with a small hilar depression, the younger and the older ones nearly the same size, but the latter with thick, the former with thin walls and consequently neither amyloid nor pseudoamyloid in a younger stage, later strongly pseudoamyloid; *basidia* $23-26 \times 4.5\mu$, 4-spored; *cystidia* and cheilocystidia not seen, but in all specimens are some basidia (?) of which the walls are remarkably thickened and which became brown in iodine like mature spores; they have 2 or 4 sterigmata; *epicutis* consisting of erect piriform to balloon-shaped cells of $23-42 \times 13-25\mu$, arising from the intermixed trama; *hyphae* of the outer tissue of the stipe $2-3.5\mu$ thick, cylindrical, interwoven, with clamp connections.

Conclusion: This species was misdetermined by Ellis. It is, as the analysis shows, a small *Lepiota* of the section *Pruinosae* Murr. (*Integrellae* Kühn.) and is nearest to but distinct from *Lepiota rufipes* Morg. The new combination ***Lepiota microspora*** (Ellis) Sing. is proposed.

Gen. TUBARIA (Smith 1870 as subgenus of *Agaricus*)

CLITOCYBE WHETSTONEAE Murr., N.A.F. 9(6): 398, 1916. Type.

Spores $4.5-5.5 \times 3.4-3.5\mu$, rough, brownish-hyaline where accumulated, with 1 central guttula; *basidia* $20-25 \times 4.2-7.2\mu$; *cystidia* none; *cheilocystidia* vesiculose stipitate or bottle-shaped, $15-30 \times 7-12\mu$.

Conclusion: It seems to belong to *Tubaria* but does not belong to any species known to me. However, to be sure, a spore preparation is required.

Gen. ALNICOLA Kühn. (1926)

AGARICUS (FLAMMULA) HELVOLICEPS Berk. & Curt., Jour. Linn. Soc. 10: 290, 1868. Type.

Spores $9-15 \times 6-7.8\mu$, fusoid to almond-shaped or ovoid-almond-shaped, some rather intensely colored, others rather pale, warty and with a large perispore which loosens often together with the warts, and covers then the smooth exospore; the longest spores are the narrowest, e.g. $15 \times 6.5\mu$; *cystidia* $45-65 \times 7.8-20\mu$, bottle-shaped, about half of them thick-walled (walls up to 1.7μ thick). The tissues of the surface of the pileus are so badly destroyed and covered by spore-masses that an investigation is impossible. Fortunately there is a good spore print on paper which shows a dull brownish color ("Russet brown," R.).

Conclusion: The microscopical characters of the spores are characteristic for two genera: *Alnicola* and *Galerina*, but the cystidia are more characteristic for *Galerina* than for *Alnicola*, while the spore print excludes *Galerina* and suggests *Alnicola*. It may be a new subgenus of *Alnicola*, characterized by pleurocystidia but as we do not know the anatomical characters of the cuticle we cannot establish such a group. The fact is that *Agaricus helvoliceps* has nothing to do with *Flammula* and that it needs further study to determine the color of the fresh spore print and the structure of the cuticle.

Gen. AGROCYBE Fayod (1889)

AGARICUS (NAUCORIA) ARVENSIS Fr. sens. Libert, No. 220.

NAUCORIA TUBEROSA Henn., Hedwigia 42, Beiblatt: (311) 1903. Type.

These two types are identical and belong to the genus *Agrocybe*. They are however, not identical with *Naucoria arvalis* Fr. sens. Heim & Romagnesi. As the species of Fries belongs rather probably not to Libert's plant but to *Agrocybe arvalis* (Fr. sens. Heim & Rom.) the only name to use is Hennings' name: *Agrocybe tuberosa* (Henn.) Sing. Here follows the full description of my fresh collections which were compared with both Libert's and Hennings' types:

Pileus fulvous-pale, more brownish in the center, more pale tan at the margin, rugose between margin and center, almost dry or very little viscid, glabrous, convex to subplane, about 26 mm. in diameter; thick vesiculose

stipitate cells ($13-25\mu$ in diameter) form a kind of hymenium interrupted by single brown dermatocystidia, $15-33 \times 4-10.8\mu$; *lamellae* argillaceous, moderately broad to rather broad, $2-4$ mm., subsinuate to broadly adnate, moderately crowded to crowded; *spores* dirty brown in mass, $9-12 \times 5.5-6\mu$, ellipsoid, with a flat germ pore, smooth, double-walled; *basidia* (17)- $23-(25) \times 6-7\mu$; *cheilocystidia* attenuate at the base and at the top, bottle-shaped with a long neck $22.5-60 \times 11.5-18\mu$, with merely 0.4μ thick walls; *cystidia* $40-66 \times 14-20\mu$, the neck here mostly divided into two or sometimes more fingerlike, $7.5-10\mu$ long appendices with $0.5-0.8\mu$ thick walls; *trama* subregular, hyphae $5.5-9\mu$ thick but some of them unusually thickened up to 17μ ; *stipe* pale to brownish pale, equal, or slightly attenuate downwards or upwards, with a long gradually tapering pseudorhiza ($10-50$ mm. long), pruinose, the pseudorhiza without mycelial fibers, often connected with a subglobose dark colored sclerotium which is white inside and $15-20$ mm. large; *stipe* without pseudorhiza and sclerotium $20-70 \times 2-4$ mm., the pruina consisting of versiform dermatocystidia and dermatopseudoparaphyses, the dermatocystidia being $\pm 90 \times 12-13\mu$; under this subhymeniform layer run the parallel thin hyphae of the cortex of the *stipe*; *context* white; *taste* mild; *odor* none. *Hab.*: On tan, on enriched soil, etc., often in gardens and warm houses, solitary or in dense groups, the whole year, particularly in September. *Observation*: The description of the type was published in Singer, Studien zur Systematik der Basidiomyceten II, Beih. Bot. Centralbl. **56**: 167, 1936, but the finger-like protuberances of the pleurocystidia are not mentioned there. They were, however, also found in the type material in later examinations. *Agrocybe temulenta* (Ricken) Sing. and *Naucoria temulenta* Ricken, *Galera arvalis* var. *tuberigena* Quel., *Naucoria sclerotina* Velen. and probably also *Psilocybe tuberosa* Karst. are synonyms of the same plant.

NAUCORIA AMARA Murr., N.A.F. **10**(3): 176, 1917. Type.

Spores $11-12 \times 6-8\mu$, ellipsoid with flat germ pore, yellowish brown, smooth, double-walled; *basidia* $25-35 \times 8\mu$; *cystidia* on edge and sides of the lamellae, hyaline, $38-58 \times 14-16\mu$. Some fragments of a cellular layer on the pileus.

Conclusion: This species belongs to the section *Microspora* Sing. of the genus *Agrocybe* with large pleurocystidia and no veil. The type was collected in the N. Y. Botanical Garden July 2, 1915, and since then it has not been rediscovered until June 6, 1941, when I collected a big group of it in the Rock Garden of the N. Y. Botanical Garden, after heavy rains. The fresh specimens of **Agrocybe amara** (Murr.) Sing. comb. nov. had somewhat broader lamellae and rougher stipes but are evidently identical with the original collection.

Pileus in young specimens greyish blue with dull ochraceous pale parts,

later, particularly the umbo often brown or dull brownish, and, nearer to the margin, gilvous, pale ochraceous, the very margin staying grey bluish for a very long period, opaque in humid condition, often shining when dry, not really viscid, more or less scrobiculate at the margin and more or less folded in a part of the center, convex then slightly convex to almost flat with a low, obtuse umbo, the margin staying involute for a comparatively long period, 34-50 mm. large; the thick epicuticular layer consists of 10-30 μ thick subglobose cells; *lamellae* argillaceous-grey, later argillaceous brownish, subventricose or ventricose, board (about 8 mm.), more or less crowded, sinuato-adnexed; *spore print* colored like the print of *Agrocybe pediades*, *praecox* etc.; *spores* 9-12 \times 6-7.5 μ , like the spores of the type; *basidia* 35-40 \times 9.5 μ , 4-spored; *cheilocystidia* basidiomorph, subcylindrical-clavate, often undulate, 20-30 \times 6-8 μ ; *cystidia* not numerous, sack- or balloon-shaped to almost fusoid or bottle-shaped, 30-42 \times 18-22 μ , hyaline, rounded above; *stipe* whitish or sometimes brownish in the middle part in old specimens, but entirely pale brownish furfuraceous-rough (sub lente) and thus appearing light brownish all over, equal or with a thickened base, stuffed by a white cottony medulla, and covered by a firm cortex, 58-67 \times 4-7 mm. (above), 7-10 mm. (below); *context* fleshy, pure white; *taste* of young specimens decidedly bitter, later only very faintly acrid and farinaceous; *odor* a combination of garlic and fresh meal. *Hab.*: On beds and borders of *Sedum* and on manured ground near the walks. In groups. June.

New Fungi from Florida

WILLIAM A. MURRILL

(Herbarium, Florida Agricultural Experiment Station, Gainesville, Fla.)

Specimens here cited are permanently deposited in the herbarium of the Florida Agricultural Experiment Station, at Gainesville. The nomenclature is that used by the author in "North American Flora," but at the close of the paper certain species are transferred to genera more familiar to those using Saccardo. Capitals are employed only for personal names.

Camarophyllus fulvosiformis sp. nov.

Pileo turbinato, 3-4 cm. lato, pallido ad avellaneo-isabellino; lamellis praedecurrentibus, albis; sporis ovoideis, $7 \times 4\mu$; stipite albo, glabro, 4-6 \times 0.4-0.7 cm.

Pileus turbinate, convex to expanded, gregarious, 3-4 cm. broad; surface dry, smooth, glabrous, pallid to avellaneous-isabelline; margin straight, even, entire; context thin, white, fragrant, mild; lamellae long-decurrent, rather distant, inserted, interveined, rather narrow, entire, white; spores ovoid, smooth, hyaline, granular, about $7 \times 4\mu$; cystidia none; stipe equal or slightly enlarged upward, smooth, glabrous, shining, white, 4-6 \times 0.4-0.7 cm.

Type collected by J. R. Watson and W. A. Murrill in leaf-mold in a climax hammock southwest of Gainesville, Fla., Jan. 21, 1940 (*F* 20129). Also collected by West and Murrill in high hammocks in various parts of Alachua Co. (*F* 18740, *F* 20010, *F* 20100). Suggesting *C. fulvosus* (Bolt.) Murrill but having a more slender stipe.

Clitocybe praticola sp. nov.

Pileo convexo-depresso, gregario, 1.5-2.5 cm. lato, avellaneo, glabro, sapore grato; lamellis decurrentibus, distantibus, albis; sporis 7-8 \times 3-4 μ ; stipite subavellaneo, glabro, 1.5-2 \times 0.1-0.4 cm.

Pileus convex to depressed, gregarious, 1.5-2.5 cm. broad; surface dry, smooth, glabrous, dark-avellaneous, paler on drying; margin even, entire to undulate, strongly deflexed until maturity; context thin, pallid, hygrophanous, odorless, mild; lamellae decurrent, distant, rather narrow, with short narrower ones inserted near the margin, entire, white, grayish when dry; spores pip-shaped, slightly curved at times, obliquely apiculate, 1-guttulate, smooth, hyaline, 7-8 \times 3-4 μ ; cystidia none; stipe fleshy, usually much enlarged upward, smooth, glabrous, pale-avellaneous or pallid, about 1.5-2 \times 0.1-0.4 cm.

Type collected by W. A. Murrill on a lawn partly shaded by oaks and long-leaf pines in Gainesville, Fla., Jan. 8, 1940 (*F* 19098). Not suggesting anything in particular. Apparently adapted to cool weather.

Clitocybe azalearum sp. nov.

Pileo irregulari, infundibuliformi, 4.5 cm. lato, pallido, glabro; lamellis pallidis, distantibus, sporis ovoideis, $5 \times 3\mu$; stipite pallido, compresso, $3 \times 0.5-0.8$ cm.

Pileus irregular, infundibuliform, gregarious, reaching 4.5 cm. broad; surface dull, glabrous, uniformly pallid to pale-avellaneous, pallid on drying; margin even, entire to undulate; context very thin, white, unchanging, mild, slightly fragrant; lamellae adnate or slightly decurrent, mostly tapering behind, arcuate, narrow, distant, inserted, some forked, white to isabelline, drying darker; spores ovoid, smooth, hyaline, 1-guttulate, about $5 \times 3\mu$; cystidia none; stipe rather tough and slightly flexible, hollow, flat, subglabrous, dull-avellaneous, drying pallid, $3 \times 0.5-0.8$ cm.

Type collected by W. A. Murrill among humus in an azalea bed at Gainesville, Fla., July 13, 1939 (*F* 19732). Suggesting *C. infundibuliformis* but entirely distinct in color and gill arrangement.

Cortinellus azalearum sp. nov.

Pileo convexo, umbonato, 5 cm. lato, squamuloso, latericio, farinaceo; lamellis adnatis, albis, sporis ellipsoideis, $4 \times 2.5\mu$; stipite isabellino, $4-5 \times 0.5-0.7$ cm.

Pileus convex, umbonate, not fully expanding, gregarious, reaching 5 cm. broad; surface dry, dark-bay on the umbo, covered with numerous latericious scales, margin even, entire; context thin, white, unchanging odor and taste strongly farinaceous; lamellae adnexed, medium broad, entire, close, inserted, white, unchanging; spores ellipsoid, smooth, hyaline, 1-guttulate, about $4 \times 2.5\mu$; cystidia none; stipe equal, isabelline, stuffed, rough and latericious below, hispid at the base, about $4-5 \times 0.5-0.7$ cm.

Type collected by W. A. Murrill among humus in an azalea bed at Gainesville, Fla., June 16, 1939 (*F* 19726). Suggesting *C. vaccinus* but the gills are not spotted and the spores are much smaller.

Gymnopus atriceps sp. nov.

Pileo convexo, subumbonato, 1.5-2 cm. lato, atrofuligineo, farinaceo; lamellis sinuatis, albis; sporis ovoideis, $5-6 \times 3-4\mu$; stipite subumbrino, $2-3 \times 0.2-0.3$ cm.

Pileus convex, not fully expanding, slightly umbonate, gregarious or cespitose, 1.5-2 cm. broad; surface hygrophanous, smooth, glabrous, slightly streaked, uniformly dark-fuliginous, margin incurved, even, entire; context thin, whitish, with farinaceous odor and taste; lamellae plane, adnate to sinuate, rather distant, medium broad, inserted, entire, white, unchanging; spores ovoid, smooth, hyaline, granular, about $5-6 \times 3-4\mu$;

cystidia none; stipe cartilaginous, equal, smooth, glabrous, streaked, avelaneous to pale-umbrinous, hollow, $2-3 \times 0.2-0.3$ cm.

Type collected by J. R. Watson and W. A. Murrill in leaf-mold under hardwoods in a low hammock at Gulf Hammock, Levy Co., Fla., Jan. 14, 1940 (*F 20128*). Also collected by E. West under oaks at Sugarfoot, near Gainesville, Fla., Jan. 11, 1940 (*F 20141*). A small dark species that dries black. It seems to thrive in cool weather and on damp, shaded ground.

Gymnopus coniceps sp. nov.

Pileo conico-convexo, gregario vel caespitoso, 1-2 cm. lato, albo, glabro, grato; lamellis adnexus, latis, albis; sporis ellipsoideis, $7 \times 4\mu$; stipite glabro, albido, $2-3 \times 0.1-0.3$ cm.

Pileus conic or convex with conic umbo, not fully expanding, gregarious or caespitose, 1-2 cm. broad; surface uniformly whitish with a slight isabeline tint, unchanging, dry, smooth, glabrous, margin even, entire to undulate, sometimes slightly upturned with age; context thin, white, unchanging, with agreeable odor and mild flavor; lamellae adnexed, ventricose, inserted, rather broad and rather close, entire, white, unchanging; spores ellipsoid, smooth, hyaline, with one very large nucleus, about $7 \times 4\mu$; stipe equal, often compressed, finely striate, glabrous, whitish, unchanging, $2-3 \times 0.1-0.3$ cm.

Type collected by W. A. Murrill in a low, open, grassy place where a fire had been built, in Gainesville, Fla., Sept. 23, 1941 (*F 19360*). About three dozen hymenophores were found in this small area, growing in the mixture of soil and ashes. The "nucleus" of the spore is relatively enormous.

Hydrocybe roseiceps sp. nov.

Pileo convexo-subexpanso, 1.5-2 cm. lato, praeviscido, roseo; lamellis decurrentibus, distantibus, stramineis; sporis ellipsoideis, $5 \times 3\mu$; stipite praeviscido, ochroleuco, $3-6 \times 0.2-0.3$ cm.

Pileus convex to subexpanded, neither umbonate nor depressed, gregarious, 1.5-2 cm. broad; surface slimy-viscid, smooth, glabrous, roseous, fading on drying; margin even, entire to undulate; context very thin, white, unchanging, odorless; lamellae slightly decurrent, distant, inserted, not interveined, broad, not arcuate, entire, stramineous; spores ellipsoid, smooth, hyaline, 1-guttulate, about $5 \times 3\mu$; cystidia none; stipe slimy-viscid, equal, smooth, glabrous, ochroleucous, somewhat darker after drying, $3-6 \times 0.2-0.3$ cm.

Type collected by Erdman West among mosses in wet ground at Planera Hammock, eleven miles northwest of Gainesville, Fla., Feb. 13, 1939 (*F 18737*). The cap may become slightly depressed in drying. It usually retains a rosy tint.

Hygrophorus Westii sp. nov.

Pileo convexo, 4 cm. lato, praeviscido, pallido; lamellis adnexis, angustatis; sporis ellipsoideis, $6 \times 3\mu$; stipite albo, viscido, $2-3 \times 0.5-1$ cm.

Pileus convex, not expanding, slightly umbilicate, 4 cm. broad; surface slimy-viscid, smooth, glabrous, pallid with a yellowish tint, disk slightly darker; margin involute, even, entire; context thin, white, mild, the odor somewhat disagreeable; lamellae arcuate, adnexed, tapering behind, close, narrow, inserted, dry, white; spores oblong-ellipsoid, smooth, hyaline, about $6 \times 3\mu$; cystidia none; stipe slimy-viscid, enlarged above or below, white, white-floccose at the apex, $2-3 \times 0.5-1$ cm.

Type collected by Erdman West under oaks near Hogtown Creek, Gainesville, Fla., Jan. 11, 1940 (*F* 19307). One of the distinctly viscid species with very little color.

Lepiota subcultorum sp. nov.

Pileo convexo, umbonato, 1-1.5 cm. lato, fuligineo-squamuloso; lamellis latis, albis, sporis ellipsoideis, albis, $9-11 \times 6\mu$; stipite albo, $2-2.5 \times 0.2$ cm., annulo albo, amplo.

Pileus convex with large umbo, not fully expanding, gregarious, 1-1.5 cm. broad, rarely 2.5 cm.; surface dry, blackish-fuliginous on the truncate umbo and covered with small dark-fuliginous scales, margin even, entire; context very thin, white, unchanging, odor none, taste mild; lamellae free, broad, rather crowded, inserted, entire, white, unchanging; spores ellipsoid, smooth, hyaline, 1-guttulate, $9-11 \times 6\mu$; stipe equal, smooth, subglabrous, white, $2-2.5 \times 0.2$ cm.; annulus apical, ample, persistent, fixed, white, membranous.

Type collected by W. A. Murrill in bare ground near a hedge in Gainesville, Fla., Aug. 29, 1939 (*F* 19966). A very attractive species, shaped like a hat with the brim turned down. The spores are not cymbiform. They are always rounded at the tip but may be slightly narrowed toward the base, the long apiculus being either central or oblique.

Lepiota subpumila sp. nov.

Pileo conico-convexo, umbonato, 3 mm. lato, griseo, punctato-squamuloso; lamellis subisabellinis, subdistantibus, latis; sporis subellipsoideis, hyalinis, $5 \times 3\mu$; stipite albo, 1.5 cm. longo; annulo amplo, albo, persistente.

Pileus conic to convex, not fully expanding, umbonate, solitary, 3 mm. broad; surface dry, gray, finely punctate-squamulose, darker at the center on drying, margin even, entire; context very thin, white, unchanging; lamellae free, medium distant, broader toward the margin, entire, yellowish; spores subellipsoid, obliquely apiculate, 1-guttulate, smooth, white,

about $5 \times 3\mu$; stipe filiform, smooth, white, glabrous, 1.5 cm. long; annulus ample, white, persistent, fixed about the middle of the stipe.

Type collected by W. A. Murrill in leaf-mold under an oak in Gainesville, Fla., July 26, 1939 (*F* 19986). Very dainty; found but one. In the dried hymenophore the gills are isabelline, the ring remaining milk-white.

***Marasmius alachuanus* sp. nov.**

Pileo convexo, albo, sulcato, 3 cm. lato, umbilicato, caespitoso, glabro; lamellis adnatis, distantibus, albis; sporis ellipsoideis, $6 \times 4\mu$; stipite glabro, albo castaneoque, $5 \times 0.2-0.3$ cm.

Pileus convex, umbilicate, cespitose, about 3 cm. broad; surface uniformly milk-white, glabrous, conspicuously sulcate to the center, margin entire; context very thin, white, unchanging, flexible and delicate but quickly reviving, with a slight odor of anise and the taste mild, slightly farinaceous; lamellae squarely adnate, distant, inserted, interveined, rather broad, entire, white, unchanging; spores ellipsoid, obliquely apiculate, smooth, hyaline, granular, about $6 \times 4\mu$; cystidia none; stipe equal, terete or compressed, subhorny, hollow, smooth, glabrous, lustrous, white above, castaneous below, about $5 \times 0.2-0.3$ cm.

Type collected by W. A. Murrill on leaf-mold in a high hammock at Gainesville, Fla., August 16, 1939 (*F* 19885). An attractive member of this difficult genus, sulcate enough to suggest *Heliomyces*, growing on leaf-mold rather than wood and at times appearing in fairy rings.

***Melanoleuca entoloma* sp. nov.**

Pileo convexo-subplano, 4-5 cm. lato, umbrino, farinaceo; lamellis sinuatis, subconfertis, pallidis, sporis $7-8 \times 4-4.5\mu$; stipite pallido, glabro, $3 \times 0.7-1$ cm.

Pileus convex to nearly plane, slightly depressed, gregarious, 4-5 cm. broad; surface dull, smooth, glabrous, uniformly umbrinous, shining when dry, margin even, undulate to lobed; context rather thin and watery, whitish, odor slightly earthy, taste at first strongly farinaceous and mild, becoming slightly unpleasant; lamellae slightly ventricose, sinuate, medium broad, rather crowded, inserted, entire, pallid, unchanged on drying; spores somewhat pip-shaped to subovoid, smooth, hyaline, 1-guttulate, about $7-8 \times 4-4.5\mu$; cystidia none; stipe short and thick, fleshy, stuffed, equal or enlarged upward, compressed, smooth, glabrous, finely scurfy at the apex, dull, pallid, $3 \times 0.7-1$ cm.

Type collected by J. R. Watson and W. A. Murrill in leaf-mold under hardwoods in a high hammock at Planera Hammock, eleven miles north-west of Gainesville, Fla., Jan. 5, 1940 (*F* 19292). So much like a species of

Entoloma when fresh that I was surprised to find the spore-print chalk-white.

***Melanoleuca malodora* sp. nov.**

Pileo conico-depresso, gregario, 6–8 cm. lato, pallido, farinaceo; lamellis sinuatis, latis, pallidis; sporis ovoideis, $8-9 \times 4-5\mu$; stipite glabro, pallido, $6-8 \times 1.4-1.8$ cm.

Pileus conic to plane or depressed, gregarious, 6–8 cm. broad; surface slightly viscid, smooth, glabrous, uniformly pallid to isabelline; margin even, entire to reflexed and rimose; context thin, white, with a strong earthy odor and a very farinaceous taste; lamellae deeply sinuate with decurrent tooth, rather close, inserted, 1 cm. or more broad, entire, whitish to discolored; spores ovoid, smooth, hyaline, obliquely apiculate, 1-guttulate, about $8-9 \times 4-5\mu$; cystidia none; stipe equal or tapering downward, smooth, glabrous, pallid, $6-8 \times 1.4-1.8$ cm.

Type collected by J. R. Watson and W. A. Murrill under live-oaks southwest of Gainesville, Fla., Jan. 21, 1940 (*F* 20102). A rather large species with pronounced odor and taste.

***Melanoleuca peralba* sp. nov.**

Pileo convexo, gregario, 8–10 cm. lato, viscido, albo, farinaceo; lamellis sinuatis, latis, albis; sporis ovoideis, $5 \times 4\mu$; stipite albo, glabro, $7-10 \times 1.5-2$ cm.

Pileus convex to subexpanded, gregarious, 8–10 cm. broad; surface viscid, smooth, glabrous, milk-white; margin at first incurved, even, entire to undulate or irregular; context thin, firm, white, unchanging, with a somewhat unpleasant earthy odor and a decidedly farinaceous pleasant flavor; lamellae sinuate, broad, ventricose, subdistant, inserted, entire, white, unchanging; spores broadly ovoid, smooth or nodulose, hyaline, about $5 \times 4\mu$; cystidia none; stipe curved, tapering downward, smooth, white, shining, stuffed, $7-10 \times 1.5-2$ cm.

Type collected by J. R. Watson and W. A. Murrill in rather moist leaf-mold in a high hammock near the Newberry Road, seven miles west of Gainesville, Fla., Jan. 8, 1940 (*F* 19271). A handsome species suggesting *M. resplendens*.

***Melanoleuca praebulbosa* sp. nov.**

Pileo convexo-depresso, 6 cm. lato, pallido, disco fuliginoso, farinaceo; lamellis sinuatis, confertis, albis; sporis ellipsoideis, $7 \times 4\mu$; stipite avel-laneo, glabro, bulboso, $4.5 \times 1-1.3$ cm.

Pileus convex to depressed, solitary, 6 cm. broad; surface dry, nearly smooth, pallid with a faint isabelline tint, marked with fine darker lines,

disk fuliginous, areolate; margin even, entire to slightly undulate, conspicuously upturned at maturity; context thin, white, with a strong unpleasant earthy odor, the taste decidedly farinaceous, at length bitter; lamellae sinuate, broad, ventricose, close, inserted, entire, white, unchanging; spores oblong-ellipsoid, smooth, hyaline, about $7 \times 4\mu$; cystidia none; stipe equal above the bulb, smooth, glabrous, avellaneous, paler at the apex, $4.5 \times 1-1.3$ cm.; bulb large, subglobose, white, about 2×2 cm.

Type collected by W. A. Murrill in leaf-mold under laurel oaks in Gainesville, Fla., Jan. 12, 1940 (*F 19310*). A conspicuous species with very large bulb and strong earthy odor. The taste is decidedly farinaceous and the odor of the freshly-cut flesh is also farinaceous.

Melanoleuca subacris sp. nov.

Pileo convexo-plano, gregario, 5-7 cm. lato, glabro, albo, margine reflexo, sapore piperato; lamellis praelatis, albis ad griseis; sporis ellipsoideis, $5-7 \times 4-5\mu$; stipite albo, glabro, subbulboso, $2-3 \times 1-1.5$ cm.

Pileus convex to plane, often decidedly upturned at the margin, gregarious or scattered, 5-7 cm. broad; surface slightly viscid when moist, smooth, glabrous, uniformly white, not shining; margin thin, straight, fertile, entire to undulate or rimose and reflexed; context thin, white, odorless, mild at first but at length decidedly acrid; lamellae rounded and deeply depressed behind, usually somewhat sinuate, crowded, inserted, thick and fleshy, entire, white, becoming slightly grayish on drying, 1 cm. or more broad; spores ellipsoid, smooth, hyaline, 1-guttulate, $5-7 \times 4-5\mu$; cystidia none; stipe short and thick, slightly bulbous, smooth, white, glabrous, $2-3 \times 1-1.5$ cm.

Type collected by W. A. Murrill in leaf-mold under laurel oaks in Gainesville, Fla., Jan. 1, 1940 (*F 20097*). Suggesting *M. acris* but not innately fibrillose. The stem is much too short and the gills too broad for *M. resplendens*.

Melanoleuca sublata sp. nov.

Pileo convexo-depresso, 7 cm. lato, albo, glabro; lamellis subadnatis, albis ad castaneis; sporis ellipsoideis, $8 \times 6\mu$; stipite albo, 4×1.5 cm.

Pileus convex to depressed, solitary, 7 cm. broad; surface dry, smooth, white, glabrous, margin even, slightly lobed, rather thick, incurved; context thick, fleshy, white, unchanging, taste unpleasant, astringent, odor strong, disagreeable, earthy with a suggestion of chloride of lime; lamellae subadnate, rounded behind, medium broad, ventricose, inserted, crowded, entire, white, becoming castaneous on drying; spores broadly ellipsoid, obliquely apiculate, smooth, hyaline, 1-guttulate, about $8 \times 6\mu$; stipe subequal, smooth, glabrous, chalk-white, reddish-brown when bruised but drying white, 4×1.5 cm.

Type collected by W. A. Murrill in leaf-mold under a laurel oak in Gainesville, Fla., Aug. 30, 1939 (*F 19946*). A rare and very distinct species, well characterized by its odor and taste and the change in its gills from white to chestnut.

***Melanoleuca subrimosa* sp. nov.**

Pileo convexo-subexpanso, gregario, 4-5 cm. lato, pallide avellaneo-isabellino, glabro, praefarinaceo; lamellis sinuatis, pallidis; sporis ovoideis, $7-8 \times 4-5\mu$; stipite albo, $3-4 \times 0.6-0.9$ cm.

Pileus convex to subexpanded, gregarious, 4-5 cm. broad; surface dry or nearly so, smooth, glabrous, uniformly pale-avellaneous-isabelline, paler and subshining when dried; margin even, entire; context thin, white, odorless, taste very farinaceous; lamellae plane, sinuate, close, medium broad, inserted, entire, pallid to stramineous, usually pallid when dried; spores ovoid, smooth, hyaline, granular, about $7-8 \times 4-5\mu$; cystidia none; stipe equal, stuffed, finely grooved, glabrous, white, about $3-4 \times 0.6-0.9$ cm.

Type collected by J. R. Watson and W. A. Murrill in a low spot in a live-oak thicket southwest of Gainesville, Fla., Jan. 21, 1940 (*F 20077*). Having few distinctive characteristics; color generally pallid and taste very farinaceous.

***Melanoleuca virginea* sp. nov.**

Pileo convexo-plano, gregario, 3 cm. lato, albo, farinaceo; lamellis confertis, sinuatis, albis; sporis ovoideis, $6-7 \times 4-5\mu$; stipite albo, glabro, $2-3 \times 1$ cm.

White throughout, unchanging; pileus convex to plane, gregarious, about 3 cm. broad; surface smooth, glabrous, margin even, entire or undulate; context with strongly farinaceous odor and taste; lamellae sinuate, narrow, close, inserted, entire; spores ovoid, smooth, hyaline, granular, $6-7 \times 4-5\mu$; cystidia none; stipe equal, smooth, glabrous, $2-3 \times 1$ cm.

Type collected by W. A. Murrill in leaf-mold under laurel oaks in Gainesville, Fla., Jan. 16, 1940 (*F 20101*). About twenty hymenophores were found in a square foot of space. If taste were a criterion this species would be excellent for the table.

***Omphalina alachuana* sp. nov.**

Pileo convexo, umbilicato, gregario, 1-1.5 cm. lato, tomentosulō, subavellaneo; lamellis subdistantibus, decurrentibus, albis; sporis ellipsoideis, $8-9 \times 4\mu$; stipite albido subgriseoque, $1-1.5 \times 0.1-0.2$ cm.

Pileus convex, deeply umbilicate, gregarious, 1-1.5 cm. broad; surface dry, smooth, tomentulose, very pale avellaneous, margin at first incurved, even, entire, often becoming revolute, sulcate or rimose with age; context very thin, white, odorless, mild; lamellae rather distant, narrow, arcuate,

long-decurrent, interveined, some forked near margin, inserted, entire, white; spores ellipsoid, smooth, hyaline, granular, obliquely apiculate, about $8-9 \times 4\mu$; stipe subequal, whitish or grayish, finely pubescent, $1-1.5 \times 0.1-0.2$ cm.

Type collected by W. A. Murrill on dead grass roots in open ground at Gainesville, Fla., Aug. 28, 1939 (*F. 19861*). Typical of the genus, occurring in abundance at the type locality.

***Lepista praevillosa* sp. nov.**

Pileo convexo, 3.5 cm. lato, isabellino, villosio; lamellis sinuatis, albis, sporis subellipsoideis, $7 \times 4\mu$; stipite albo, glabro, 4×0.8 cm.

Pileus convex, not fully expanding, solitary, about 3.5 cm. broad; surface isabelline, villous, margin even, entire; context thick, white, unchanging, mild, odorless; lamellae deeply sinuate, ventricose, medium broad, rather close, inserted, finely eroded, white; spores pale-purplish in mass, subellipsoid, inequilateral, not angular, smooth, pale-pinkish, about $7 \times 4\mu$; cystidia none; stipe equal, white, glabrous, rough, grooved, about 4×0.8 cm.

Type collected by W. A. Murrill in sandy soil in high-pine-oak woods at Gainesville, Fla., July 12, 1939 (*F. 19723*). Also collected in the same place, July 6, 1939 (*F. 19703*). Remarkable for its shaggy coat and smooth, pale-pinkish spores shaped like navy beans.

***Pleuropus floridanus* sp. nov.**

Pileo convexo, umbilicato, 1.5 cm. lato, pallido, farinaceo; lamellis latis, albis, sporis angulatis, $9-11 \times 6-8\mu$; stipite albo, $2 \times 0.1-0.2$ cm.

Pileus convex, deeply umbilicate, subcespitose, 1.5 cm. broad; surface dry, finely fibrillose, pallid, subrugose, slightly zonate at times, shining and with a grayish tint when dry, margin incurved, quite even, subentire; context very thin, white, with strongly farinaceous odor and taste; lamellae broad, inserted, close, short-decurrent or adnate with decurrent tooth, entire, white; spores ellipsoid in outline, obliquely apiculate, distinctly angular, granular or 1-2-guttulate, pink, $9-11 \times 6-8\mu$; cystidia none; stipe tapering downward, fleshy with a tough rind, white, glabrous, about $2 \times 0.1-0.2$ cm.

Type collected by W. A. Murrill in an open grassy lawn at Gainesville, Fla., Aug. 29, 1939 (*F. 19837*). A rare species and quite distinct.

***Pleuropus minimus* sp. nov.**

Pileo depresso, gregario, 1-2 cm. lato, glabro, albo, farinaceo; lamellis angustatis, albis; sporis roseis, $6 \times 4\mu$; stipite glabro, albo $5-10 \times 1-3$ mm.

Pileus irregularly circular, deeply depressed, gregarious, 1-2 cm. broad; surface glabrous, white, margin incurved, undulate to crisped; context

very thin, white, odor strongly farinaceous, taste slightly astringent, sometimes bitter; lamellae adnate or adnexed, some with decurrent tooth, narrow, rather close, thin, entire, inserted, clear-white when young; spores ovoid or ellipsoid, smooth, granular, pale-roseous, about $6 \times 4\mu$; stipe central, sometimes eccentric, smooth, white, glabrous, irregular, subcartilaginous, $5-10 \times 1-3$ mm.

Type collected by W. A. Murrill on a lawn in Gainesville, Sept. 12, 1941 (*F* 19980).

***Pleuropus nyssicola* sp. nov.**

Pileo depresso, caespitoso, 4-5 cm. lato, hispidulo, albo ad subpurpureo; lamellis subdecurrentibus, confertis, sporis globosis, 5μ ; stipite pallido, fibrilloso, $1-2 \times 0.5$ cm.

Pileus irregular, deeply depressed, caespitose, 4-5 cm. broad; surface dry, uneven, finely hispid, white to cremeous or pale-purplish with dark-purple lines; context very thin, odorless, mild; lamellae short-decurrent, close, forked, inserted, flocculose on the edges, dull rosy-isabelline; spores globose, smooth, pale-pink, 1-guttulate, about 5μ ; cystidia none; stipe flexible, rather tough, flat, pallid, shaggy all over, $1-2 \times 0.5$ cm.

Type collected by W. A. Murrill on the base of a dead *Nyssa biflora* in a pond cypress bog in Gainesville, Fla., April 20, 1939 (*F* 19730). Suggesting certain species of *Cortinellus* but having pink spores.

***Volvariopsis alachuana* sp. nov.**

Pileo convexo ad subexpanso, 3-5 cm. lato, albo, disco fusco, innato-fibrilloso; lamellis liberis, latis, confertis, albis; spores ellipsoideis, $6 \times 4\mu$, cystidiis parvis; stipite albo, glabro, 4-5 cm. longo; volva triloba, subtomentosa, umbrina, 1.5×1 cm.

Pileus convex to subexpanded, slightly umbonate at times, scattered, 3-5 cm. broad; surface dry, shining, finely innate-fibrillose, white, blackish on the broad disk, margin entire, fertile; context very thin, white, unchanging; lamellae free, rounded behind, broad, close, inserted, finely eroded, white to pink; spores ellipsoid, smooth, pink, 1-guttulate, about $6 \times 4\mu$; cystidia few, smooth, hyaline, ovoid, projecting about $20 \times 12\mu$; stipe tapering upward, smooth, glabrous, white, $4-5 \times 0.3-0.8$ cm.; volva trifid, umbrinous, finely tomentose, about 1.5 cm. high and 1 cm. broad.

Type collected by W. A. Murrill under oaks on filled ground at Gainesville, Fla., July 6, 1939 (*F* 19655). The volva is particularly interesting.

***Volvariopsis fimetaria* sp. nov.**

Pileo convexo, 4 cm. lato, atro-avellaneo, rimoso; lamellis liberis, confertis, albis; sporis ovoideis, $5 \times 3-4\mu$; stipite albo, $5 \times 0.3-0.6$ cm.; volva subglabra, isabellina, 1×1 cm.

Pileus convex, not fully expanding, solitary, 4 cm. broad; surface dry, glabrous, dark-avellaneous, radiate-rimose, margin entire; context very thin, pallid, with agreeable odor; lamellae free, close, medium broad, inserted, entire, white to dull-pink; spores ovoid, smooth, pink, 1-guttulate, about $5 \times 3-4\mu$; stipe tapering upward, smooth, glabrous, white, unchanging, $5 \times 0.3-0.6$ cm.; volva ample, scarcely lobed, white within, isabelline and subglabrous without, 1×1 cm.

Type collected by W. A. Murrill on cow manure under a live-oak five miles south of Phifer, Alachua Co., Fla., Sept. 24, 1939 (*F* 19992).

***Cortinarius albiceps* sp. nov.**

Pileo convexo, 2-3 cm. lato, subviscido, albo; lamellis sinuatis, confertis, sporis ovoideis, $8-10 \times 4-5\mu$; stipite albo, bulboso, 4×0.5 cm.

Pileus convex to compressed-hemispheric, gregarious, 2-3 cm. broad; surface slightly viscid, smooth, glabrous, white, not shining; margin even, entire, incurved on drying; context very thin, white, odorless, mild, mawkish; lamellae sinuate, plane, broad, close, inserted, entire, dark-roseous when first seen, becoming fulvous; spores irregularly oblong-ovoid, inequilateral, pointed, obliquely apiculate, smooth, 1-guttulate, ferruginous, about $8-10 \times 4-5\mu$; cystidia none; stipe equal above the globose, immarginate bulb, smooth, white, shining, furfuraceous above, glabrous below, about 4×0.5 cm.; cortina evanescent, leaving no trace.

Type collected by West, Arnold and Murrill in leaf-mold in low ground under hardwood trees at Magnesia Springs, Alachua Co., Fla., July 15, 1938 (*F* 17941). Suggesting *C. communis* Peck. Found but once. My notes on the fresh specimens state that the spores are purplish-brown, but under the microscope they are deep-ferruginous and of the usual *Cortinarius* type.

***Cortinarius Davisii* sp. nov.**

Pileo convexo, caespitoso, 4-6 cm. lato, lilacino; lamellis adnatis, sporis fusoides, tuberculatis, $12 \times 5\mu$; stipite albo lilacinoque, bulboso, marginato, $3-4 \times 1.5-2$ cm.

Pileus convex, not fully expanding, caespitose, 4-6 cm. broad; surface slightly viscid, smooth, glabrous, pale-lilac, margin even, entire; context thick, white, mild, odor slight and rather peculiar; lamellae squarely adnate, crowded, inserted, medium broad, entire, pallid to rusty; spores fusoid, coarsely tuberculate, deep-ferruginous, with a few large granules, about $12 \times 5\mu$; cystidia none; stipe white above, lilac at the base, $3-4 \times 1.5-2$ cm.; bulb marginate, 2.5 cm. wide; cortina copious, violet, quite persistent, leaving a trace on the stipe.

Type collected by Eli Davis and Erdman West in a low hammock at Magnesia Springs, Fla., Feb. 11, 1939 (*F* 19207). Also collected by West

and Murrill in South Planera Hammock, Oct. 26, 1938 (*F* 19216). Suggesting *C. velicopia* C. H. Kauffm. Mr. Davis came to Florida to hunt myxomycetes. He was inducted into the mysteries of mycology by John Dearness.

***Cortinarius flammuliformis* sp. nov.**

Pileo convexo, 3 cm. lato, isabellino, glabro; lamellis sinuatis, latis; sporis ellipsoideis, $8 \times 4\mu$; stipite albo, glabro, $7 \times 0.6-0.7$ cm.

Pileus campanulate to broadly convex, solitary, 3 cm. broad; surface dry, isabelline, smooth, glabrous; margin deflexed, even, undulate; context thin, pallid, with the odor and taste of radishes; lamellae plane, sinuate, broad, medium distant, inserted, entire; spores ellipsoid, obliquely apiculate, smooth, granular, pale-ferruginous under the microscope, about $8 \times 4\mu$; cystidia none; stipe subequal, smooth, glabrous, satiny-white, not bulbous, $7 \times 0.6-0.7$ cm.; cortina slight, evanescent.

Type collected by W. A. Murrill in leaf-mold under laurel oaks in Gainesville, Fla., Jan. 12, 1940 (*F* 19314). Strongly suggesting certain species of *Flammula*. Several species of *Cortinarius*, such as *C. aureifolius*, *C. armeniacus*, *C. evernius* and others, have the odor of radishes.

***Cortinarius straminipes* sp. nov.**

Pileo convexo, 8 cm. lato, glabro, ferrugineo-fulvo; lamellis adnexas, latis, pallidis; sporis subfusiformibus, $8-10 \times 4-5\mu$; stipite stramineo, glabro, 3×2 cm.

Pileus convex to slightly depressed, solitary, 8 cm. broad; surface smooth, glabrous, slightly viscid when moist, uniformly ferruginous-fulvous, margin even, entire, narrowly sterile and deflexed; context thin except at the center, white, odorless, sweet; lamellae adnexed, very broad, crowded, inserted, undulate on the edge, pallid to fulvous; spores almond-shaped or subfusiform, rough-punctate, ferruginous, about $8-10 \times 4-5\mu$; cystidia none; stipe short and thick, equal, not bulbous, dry, smooth, glabrous, stramineous, about 3×2 cm.; veil evanescent, leaving no trace.

Type collected by E. West on a creek bank in a hammock in Gainesville, Fla., Jan. 17, 1939 (*F* 19571). Found but once. Apparently a cool-weather species.

***Galerula canalipes* sp. nov.**

Pileo conico, 2-3 cm. lato, isabellino, sapore grato; lamellis adnexas, albis; sporis ellipsoideis, $8-9 \times 5-6\mu$; stipite bulboso, canaliculato, $3-4 \times 0.2-0.3$ cm.

Pileus narrowly to broadly conic, gregarious, 2-3 cm. broad; surface smooth, glabrous, hygrophanous, isabelline, dark-isabelline when young and remaining so on the umbo; margin entire, even, straight when young; context very thin, white, mild, odorless; lamellae adnexed, ventricose,

crowded, inserted, medium broad, entire, white to isabelline and finally fulvous; spores broadly ellipsoid, truncate, smooth, ferruginous, with a few small guttae, $8-9 \times 5-6\mu$; cystidia none; stipe tapering upward from an onion-shaped base, slightly radicate, cartilaginous, stuffed, pallid to isabelline, pruinose to subglabrous, canaliculate for its entire length, $3-4 \times 0.2-0.3$ cm.; bulb 5 mm. in diameter.

Type collected by W. A. Murrill on cow dung in a low hammock at Magnesia Springs, Fla., Feb. 11, 1939 (*F* 18714). The grooving of the stipe is remarkable and beautiful, the furrows being regular, deep, and close like the flutings on a Corinthian column.

***Galerula crispella* sp. nov.**

Pileo convexo-subexpanso, subgregario, 2-2.5 cm. lato, striato, pallido, disco isabellino; lamellis adnexis, sporis ellipsoideis, $11-13 \times 6-8\mu$; stipite albo, bulboso, 5-7 cm. longo.

Pileus convex to subexpanded, never conic or plane, somewhat gregarious, 2-2.5 cm. broad; surface dry, pallid, finely striate to the small isabelline disk, margin entire; context membranous, white, unchanging, mild, odorless; lamellae adnexed, rounded behind, narrow, close, inserted, entire, pallid; spores ellipsoid, smooth, ferruginous, stalked, $11-13 \times 6-8\mu$; stipe slender, equal above the small basal bulb, grooved, finely pubescent, white, 5-7 cm. long.

Type collected by W. A. Murrill in grass on an open lawn in Gainesville, Fla., Aug. 5, 1941 (*F* 18576). Not known from elsewhere. Closely related to *G. crispa* (Longyear) Murrill.

***Galerula fuscimarginata* sp. nov.**

Pileo conico, gregario, 1 cm. lato, glabro, isabellino; lamellis adnatis, confertis, angustibus; sporis ellipsoideis, $10 \times 7\mu$; stipite pallido, substriato, clavato, 4-5 \times 0.1 cm.

Pileus conic, not expanding, gregarious, about 1×1 cm.; surface dry, smooth, glabrous, uniformly isabelline, margin even, entire, becoming brownish with age; context membranous; lamellae adnate, inserted, narrow, crowded, entire; spores ellipsoid, smooth, ferruginous, 1-2-guttulate, about $10 \times 7\mu$; stipe striate, pallid, enlarged and pubescent above, clavate at the base, 4-5 cm. long, 1 mm. or less thick.

Type collected by W. A. Murrill in a partly-shaded cultivated field at Gainesville, Fla., May 12, 1939 (*F* 15977).

***Galerula subcrispa* sp. nov.**

Pileo conico ad expanso depressoque, 7 mm. lato, pallido, disco isabellino, praesculcato; lamellis adnexis, angustatis, subdistantibus; sporis ellipsoideis, ferrugineis, $14 \times 7\mu$; stipite 5-6 cm. longo, albo, bulboso.

Pileus conic, becoming depressed with age, scattered, about 7 mm. broad; surface pallid, isabelline on the disk, glabrous, sulcate to the center, margin entire, upturned with age; context membranous, white, odorless; lamellae adnexed, inserted, narrow, rather distant, entire, white; spores oblong-ellipsoid, smooth, granular, deep-ferruginous, about $14 \times 7\mu$; cystidia none; stipe very long and slender, tapering upward from a small rounded bulb, snow-white, slightly fibrillose, $5-6 \times 0.05-0.15$ cm.

Type collected by W. A. Murrill in a grassy lawn under a longleaf pine at Gainesville, Fla., July 26, 1939 (*F 19818*). Very tall, slender, whitish; probably nearest to *G. crispa*. Found but once.

***Hebeloma alachuanum* sp. nov.**

Pileo convexo-plano, 3 cm. lato, rubro-brunneo, subfelleo; lamellis sinuatis, sporis elongatis, $8.5-9.5 \times 4-5\mu$; stipite albo, $3-4 \times 0.4-0.6$ cm.

Pileus convex to expanded, gregarious, about 3 cm. broad; surface slightly viscid, smooth, glabrous, uniformly pale-reddish-brown, margin even, entire, sometimes upturned in age; context thin, pallid, odorless, mawkish and somewhat bitter; lamellae sinuate, medium broad, medium distant, inserted, entire, pallid to subfulvous; spores elongate-ellipsoid, smooth, pale-yellowish-brown, 1-guttulate, $8.5-9.5 \times 4-5\mu$; cystidia none; stipe equal, smooth, glabrous, white, about $3-4 \times 0.4-0.6$ cm.

Type collected by W. A. Murrill on the ground in a grove of loblolly pines in Gainesville, Fla., Jan. 11, 1938 (*F 16042*). Rather abundant in two or three places in the grove, growing close together but not clustered.

***Hebeloma verruculosum* sp. nov.**

Pileo convexo, 8 cm. lato, perviscido, pallido; lamellis adnatis, pallidis, sporis ovoideis, subverrucosis, pallide-ferrugineis, $12 \times 6\mu$; stipite albo, glabro, sicco, 9×2 cm.

Pileus convex, not expanding, solitary, 8 cm. broad; surface slimy-viscid, the gluten in streaks, uniformly pallid with an avellaneous tint, margin undulate; context thin, white, mild, odorless; lamellae plane, adnate, inserted, medium broad, rather distant, distinctly notched, dirty-white; spores elongate-ovoid or pip-shaped, slightly verrucose, bright-pale-ferruginous under the microscope, about $12 \times 6\mu$; stipe subequal, smooth, white, dry, glabrous, 9×2 cm.

Type collected by W. A. Murrill under red oaks in Gainesville, Florida, Jan. 22, 1941 (*F 18541*). Not known from elsewhere.

***Naucoria alachuana* sp. nov.**

Pileo convexo, 1.5 cm. lato, subtomentoso, avellaneo-isabellino; lamellis adnatis, confertis, avellaneis, fimbriatis; sporis ellipsoideis, $6 \times 4\mu$; stipite pallido, $2-2.5 \times 0.2-0.3$ cm.

Pileus convex, not fully expanding, solitary, 1.5 cm. broad; surface smooth, densely tomentulose, avellaneous-isabelline, margin entire, even, white; context very thin, grayish, odorless; lamellae squarely adnate, plane very close, inserted, medium broad, dark-avellaneous, the edges finely fringed; spores ellipsoid or bean-shaped, granular, smooth, pale-yellowish under the microscope, very blunt at the ends, about $6 \times 4\mu$; stipe tapering upward, glabrous, pallid or isabelline, striate and pulverulent at the apex, white and slightly enlarged at the base, $2-2.5 \times 0.2-0.3$ cm.

Type collected by W. A. Murrill on the end of a fallen oak branch in a low hammock in Gainesville, Fla., Jan. 15, 1940 (*F* 19305). Also collected by Arnold, West and Murrill on an oak log in Planera Hammock, Alachua Co., Fla., Jan. 16, 1940 (*F* 19317). A small grayish species with beautifully fringed gills and very blunt spores, which are often inequilateral or bean-shaped. The fringe is composed of clusters of hollow, sterile cells arranged along the edge of the gill.

***Naucoria subamara* sp. nov.**

Pileo convexo-plano, caespitoso, 2-3 cm. lato, isabellino, sapore amaro-farinaceo; lamellis adnatis, albis; sporis ellipsoideis, $15-17 \times 10\mu$; stipite $4 \times 0.2-0.4$ cm.

Pileus broadly convex to plane, never semiorbicular, not umbonate, cespitose or gregarious, 2-3 cm. broad; surface smooth, glabrous, isabelline, margin even, entire; context thin, pallid, odor farinaceous, taste bitterish-farinaceous; lamellae squarely adnate, plane, inserted, medium wide, medium close, entire, white; spores ellipsoid, smooth, granular, purplish-fulvous in mass, with a purplish tint under the microscope, about $15-17 \times 10\mu$; stipe equal, smooth, glabrous, pallid, about $4 \times 0.2-0.4$ cm.

Type collected by W. A. Murrill in sandy soil in an open field at Gainesville, Fla., May 8, 1939 (*F* 19896). Suggesting *N. amara* Murrill but having much larger spores.

***Naucoria subpediades* sp. nov.**

Pileo convexo-subexpanso, umbonato, 1-2 cm. lato, isabellino, disco fulvo, sapore farinaceo; lamellis adnatis, fulvis, sporis $12-15 \times 7-9\mu$; stipite isabellino, $3-5 \times 0.1-0.2$ cm.

Pileus conic or convex to subexpanded, umbonate, gregarious, 1-2 cm. broad; surface dry, glabrous, smooth, isabelline, fulvous on the disk, margin even, entire; context pallid, odorless, taste strongly farinaceous; lamellae adnate, broad, medium distant, inserted, entire, pallid to fulvous, the edges white; spores ellipsoid, smooth, ferruginous, $12-15 \times 7-9\mu$; stipe slender, equal, smooth, glabrous, isabelline, about $3-5 \times 0.1-0.2$ cm.

Type collected by W. A. Murrill on an open lawn in Gainesville, Fla., May 27, 1938 (*F* 18162). Also collected by the author on a lawn in Gaines-

ville, Sept. 3, 1938 (*F 18187*); and in a field, June 8, 1938 (*F 18191*). Suggesting *N. semiorbicularis* (Bull.) Quél. but smaller and of different shape.

***Agaricus subalachuanus* sp. nov.**

Pileo convexo, subumbonato, gregario, 2-3.5 cm. lato, roseo-avellaneo-squamuloso; sporis ellipsoideis, $5-7 \times 3-4\mu$; stipite albo, $2-3 \times 0.5$ cm.; annulo albo, persistente.

Pileus convex, subumbonate, not fully expanding, gregarious or scattered, 2-3.5 cm. broad; surface dry, white, with rosy-avellaneous scales, darker on the disk, margin even, fringed with fragments of the veil; context thin, white; lamellae free, crowded, entire, white to pink and finally blackish; spores ellipsoid, smooth, purplish-brown, 1-guttulate $5-7 \times 3-4\mu$; stipe equal or tapering upward, white, slightly fibrillose, about $2-3 \times 0.5$ cm.; annulus white, membranous, persistent, fixed above the middle of the stipe, not becoming yellow on drying.

Type collected by W. A. Murrill on an open lawn in Gainesville, Fla., Aug. 29, 1939 (*F 19900*). Also collected by me nearby on Aug. 30, 1939 (*F 19920*). Differing from *A. alachuanus* Murrill in its convex cap, larger scales, and persistently white ring. At certain times it is abundant, occasionally forming fairy rings. It loves open grassy ground, while *A. alachuanus* grows in rich soil under oaks.

***Agaricus subarvensis* sp. nov.**

Pileo convexo-expanso, umbonato, 8 cm. lato, squamuloso, disco badio; lamellis confertis, pallidis, sporis ellipsoideis, $6-7 \times 4-4.5\mu$; stipite albo, $12 \times 1.5-2.5$ cm., annulo amplo.

Pileus convex to expanded, broadly umbonate, solitary, 8 cm. broad; surface pallid with small rosy-avellaneous scales, light-bay and smooth on the disk, margin even, entire, sometimes splitting with age; context thin, white, unchanging, with agreeable odor and taste; lamellae rather narrow, crowded, inserted, entire, pallid, finally blackish; spores ellipsoid, smooth, obliquely apiculate, opaque, purplish-brown, 1-guttulate, about $6-7 \times 4-4.5\mu$; stipe greatly enlarged below, smooth, glabrous, white, shining, unchanging, $12 \times 1.5-2.5$ cm.; annulus apical, ample, white, persistent, scarcely double.

Type collected by J. R. Watson and W. A. Murrill in open cultivated soil at Lake Warburg, Alachua Co., Fla., Feb. 17, 1939 (*F 19253*). Suggesting *A. arvensis* and having the same habit but differing in color and with narrower spores. The cap does not turn yellow after drying as in *A. floridanus* and *A. auricolor*.

***Agaricus subfloridanus* sp. nov.**

Pileo convexo, pallido, squamuloso, 10-12 cm. lato; lamellis confertis, sporis $5-6 \times 3-4\mu$; stipite bulboso, albo, $6 \times 1-3$ cm.; annulo subamplo, albo, persistente.

Pileus convex, not fully expanding, subgregarious, 10–12 cm. broad; surface white or pale-yellowish, uniformly ornamented with small brownish scales; margin even, entire, white, glabrous, projecting 2–3 mm.; context very thick, white, unchanging, odor pleasant, flavor pronounced; lamellae free, inserted, very broad, crowded, entire, pallid, at length dark-brown; spores ovoid or ellipsoid, smooth, 1-guttulate, dark purplish-brown, about $5\text{--}6 \times 3\text{--}4\mu$; stipe short, thick, somewhat bulbous, smooth, glabrous, much reduced at the apex, about 6 cm. long, 1–1.5 cm. thick above and 2–3 cm. below; annulus median, rather ample, simple, white, persistent, skirt-like.

Type collected by W. A. Murrill in an open field about ten miles northwest of Gainesville, Alachua Co., Fla., Mar. 12, 1939 (*F 18611*). Loving sterile, open soil and resembling *A. floridanus* also in shape but squamulose over the entire surface of the cap. A handsome species that should be cultivated if possible.

***Agaricus suboreades* sp. nov.**

Pileo convexo-subexpanso, 2–3 cm. lato, roseo, squamuloso; sporis ellipsoideis, $5.5\text{--}7 \times 3\text{--}4\mu$; stipite pallido, glabro, $3\text{--}4 \times 0.3\text{--}0.5$ cm.; annulo albo, persistente.

Pileus convex to nearly plane, slightly umbonate, scattered, gregarious, subcespitose, or in fairy rings, 2–3 cm. broad; surface roseous, somewhat darker on the disk, squamulose, margin even, entire, not projecting; context thin, white, with agreeable odor and taste; lamellae free, rounded behind, ventricose, crowded, inserted, entire, white to roseous and finally dark-brown; spores ellipsoid, smooth, not opaque, 1-guttulate, purplish-brown, $5.5\text{--}7 \times 3\text{--}4\mu$; stipe subequal or tapering upward from a clavate base, smooth, glabrous, white at the apex, subconcolorous below, about $3\text{--}4 \times 0.3\text{--}0.5$ cm.; annulus fixed above the middle, rather small, white, persistent.

Type collected by W. A. Murrill on an exposed grassy lawn in Gainesville, Fla., July 14, 1938 (*F 17693*). Also collected by the author on a clipped lawn under a large pine in Gainesville, June 28, 1938 (*F 17257, cotype*); and again on a lawn, Sept. 5, 1938 (*F 19225*). This species lies between *A. alachuanus* and *A. comtulus* and is apparently confined to grassy ground, exposed or lightly shaded.

***Atylospora atomacea* sp. nov.**

Pileo conico-campanulato, umbonato, 1–1.5 cm. lato, brunneo, striato, atomaceo, subfelleo; lamellis adnexus, umbrinis, fimbriatis; sporis ovoideis, $6 \times 4.5\mu$; stipite roseo-isabellino, atomaceo, 1.5×0.1 cm.

Pileus conic to campanulate, umbonate, not fully expanding, closely gregarious, 1–1.5 cm. broad; surface hygrophanous, uniformly pale-chestnut-brown, conspicuously radiate-striate, white-atomate; margin entire,

straight when young; context thin, hygrophanous, pale-umbrinous, odorless, slightly bitter; lamellae adnexed, ventricose, broad, subdistant, the inserted ones narrower, pale-umbrinous, the edges beautifully white-beaded at regular intervals; spores subtriangular in outline, broadly ovoid, smooth, pale-purplish-brown in mass, 1-guttulate, about $6 \times 4.5 \mu$; stipe cartilaginous, equal, smooth, dull-rosy-isabelline, white-atomate like the pileus, about 1.5×0.1 cm.

Type collected by W. A. Murrill on a rotten sweet-gum log in a low hammock at Magnesia Springs, Fla., Feb. 11, 1939 (*F* 18762). A small species, brown throughout, covered when young with minute white particles. The dark gills are ornamented along their edges with clumps of white fringe.

***Atylospora subvestita* sp. nov.**

Pileo convexo, 1.7 cm. lato, cinereo, atomaceo; lamellis adnatis, latis; sporis ellipsoideis, castaneis, $10 \times 5-6 \mu$; stipite albo, 2×0.15 cm.

Pileus convex, not expanding, solitary, 1.7 cm. broad; surface dry, cinereous, scarcely striate, covered with mica-like particles, margin even, entire, not appendiculate; context very thin, pallid; lamellae adnate, broad, medium distant, inserted, entire, brown, white on the edges; spores elongate-ellipsoid, smooth, castaneous under the microscope, 1-guttulate, about $10 \times 5-6 \mu$; cystidia none; stipe equal above the slightly swollen base, white, glabrous and furrowed below, furfuraceous at the apex, 2×0.15 cm.

Type collected by W. A. Murrill in shaded soil at Gainesville, Fla., Mar. 3, 1939 (*F* 19960). Suggesting *P. vestita* Peck but differing in several characters. Found but once.

***Atylospora Weberi* sp. nov.**

Pileo convexo-subexpanso, 2-2.5 cm. lato, isabellino, squamuloso; lamellis adnatis vel adnaxis, latis, sporis ovoideis, $6-8 \times 3-4 \mu$; stipite albo, glabro, $2 \times 0.2-0.3$ cm.

Pileus convex to subexpanded, scattered, 2-2.5 cm. broad; surface uniformly isabelline, not viscid, covered with radiating tufts of hairs resembling scales when dry, margin concolorous, entire, even, fertile; context white, unchanging, thin, without characteristic odor or taste; lamellae adnate or adnexed to separating, broad, medium distant, inserted, thin, entire, white on the edges at first but soon colored dark by the spores, which are ovoid to elongate-ovoid, inequilateral, smooth, 1-guttulate, dark-purplish-brown, $6-8 \times 3-4 \mu$; stipe tapering downward, white, smooth, glabrous hollow, without a ring, about $2 \times 0.2-0.3$ cm.

Type collected by Dr. George F. Weber in a low hammock near Gainesville, Fla., May 4, 1941 (*F* 18640), growing on a mixture of wet soil and much-decayed wood in deep shade. Not known from elsewhere.

Campanularius pumilus sp. nov.

Pileo campanulato-convexo, 1.5–2 cm. lato, avellaneo isabellinoque, sapore grato; sporis ellipsoideis, $11 \times 7\mu$; stipite roseo-isabellino, $3-4 \times 0.2$ cm.

Pileus campanulate to hemispheric, not fully expanding, gregarious, 1.5–2 cm. broad; surface smooth, glabrous, hygrophaneous, avellaneous and isabelline, sometimes slightly rosy-avellaneous, margin even, entire; context thin except at the center, pale-rosy-avellaneous, mild, odorless; lamellae narrowly adnate, ventricose, broad, inserted, pallid when young, soon colored by the black spores, the edges white-fringed; spores ellipsoid, smooth, opaque, black, about $11 \times 7\mu$; cystidia none; stipe equal, fleshy, smooth, glabrous, hollow, rosy-isabelline, about $3-4 \times 0.2$ cm.

Type collected by W. A. Murrill on an open lawn in Gainesville, Fla., Feb. 10, 1939 (*F* 19203). Abundant and widely scattered over this lawn, usually in groups. It evidently likes cool weather.

Campanularius Westii sp. nov.

Pileo late convexo, gregario, 3–4 cm. lato, isabellino; lamellis adnatis, sporis subglobosis, $12-13 \times 10-11\mu$; stipite isabellino, $6-7 \times 0.3-0.4$ cm.

Pileus broadly convex, not fully expanding, not at all umbonate, gregarious, about 3–4 cm. broad; surface smooth, glabrous, pale-isabelline, darker isabelline on the disk; margin even, entire, deflexed, usually incurved when dry; context thin, pallid, odorless; lamellae adnate with decurrent tooth, medium broad, rather close, inserted, entire, pallid to black with white edge; spores broadly ellipsoid or subglobose, pointed at one end and truncate at the other, smooth, black, $12-13 \times 10-11\mu$; stipe equal, smooth, floccose, hollow, pale-isabelline, about $6-7 \times 0.3-0.4$ cm.

Type collected by Erdman West on cow dung in Sugarfoot Hammock, near Gainesville, Fla., June 30, 1938 (*F* 17377). Suggesting *C. semiglobatus* Murrill, but having broader spores, a different color, and no umbo. The spores might be likened to hawthorn fruits, with stalk and blossom-end.

Coprinusalachuanus sp. nov.

Pileo convexo-subexpanso, 3–4 cm. lato, striato, albo, floccoso; lamellis liberis, confertis; sporis subglobosis, $11 \times 9\mu$; stipite albo, bulboso, $7-8 \times 0.3-0.5$ cm.

Pileus convex to subexpanded, scattered, 3–4 cm. broad; surface striate, white, with white flocci, margin entire to ragged and often upturned with age; context thin, white; lamellae free, narrow, close, inserted, entire, soon blackening; spores subglobose, smooth, brownish-black, opaque, about $11 \times 9\mu$; stipe equal or tapering upward, smooth, blabrous, milk-white, bulbous, about $7-8 \times 0.3-0.5$ cm.

Type collected by W. A. Murrill in soil in an open hammock at Gainesville, Fla., Mar. 21, 1938 (*F 16094*). Found but once. The spores are shaped somewhat like short barrels, supported on tiny pegs.

***Drosophila alachuana* sp. nov.**

Pileo semigloboso, gregario, 1 cm. lato, innato-squamuloso, atro-roseo-isabellino; lamellis adnexus, confertis, pallidis; sporis elongatis, $12 \times 5\mu$; stipite albo, glabro, 2×0.3 cm.

Pileus semiglobose, not fully expanding, gregarious, 1 cm. broad; surface innate-squamulose, dark-rosy-isabelline, margin even, entire, not appendiculate; context thin, pallid; lamellae adnexed, rounded behind, narrow, crowded, entire, pallid; spores oblong-ellipsoid, smooth, smoky-yellowish under the microscope, about $12 \times 5\mu$; stipe equal, glabrous, white, about 2×0.3 cm.

Type collected by W. A. Murrill on a dead hardwood stub in a low hammock at Gainesville, Fla., Sept. 6, 1939 (*F 19972*). Slow to mature, although kept under a belljar, where it retained its convex form but ripened some spores, the gills remaining pallid. The dried caps are castaneous.

***Psathyrella Rooseveltiana* sp. nov.**

Pileo campanulato, umbonato, gregario, 1 cm. lato, glabro, sulcato, subavellaneo; lamellis adnatis, latis, distantibus; sporis atris, ellipsoideis, truncatis, $17 \times 10\mu$; stipite glabro, $5-7 \times 0.1$ cm.

Pileus campanulate, umbonate, gregarious, 1×1 cm.; surface dry, glabrous, radiate-sulcate, uniformly pale-avellaneous tinged with old-rose, margin straight, entire, sulcate; context very thin, pallid; lamellae adnate, broad, distant, entire, with white edges; spores ellipsoid, truncate, smooth, black, opaque, about $17 \times 10\mu$; stipe very slender, equal, smooth, glabrous, pale reddish-brown, 5-7 cm. long, less than 1 mm. thick.

Type collected by W. A. Murrill in sandy soil on an exposed grassy road shoulder at Camp Roosevelt, Marion Co., Fla., Sept. 27, 1941 (*F 18555*). Not known from elsewhere. The abrupt, slender umbo suggests a small handle on a large bell. The spores appear truncate because of a hyaline apical germ-pore.

***Psilocybe alachuana* sp. nov.**

Pileo convexo, 1.5 cm. lato, scabro, avellaneo-isabellino; lamellis adnexus, sporis ellipsoideis, $8 \times 5\mu$; stipite pallido, $1-1.5 \times 0.1$ cm.

Pileus broadly convex, not fully expanding, gregarious, about 1.5 cm. broad; surface hygrophane, smooth, minutely and densely scabrous, uniformly avellaneous-isabelline, pale-isabelline on drying; margin not appendiculate, even, entire, incurved to deflexed; context thin, white, mild, odorless; lamellae adnexed or narrowly adnate, broad, ventricose, medium

distant, inserted, pale-umbrinous, the edges white-fimbriate; spores irregularly ellipsoid, inequilateral, smooth, purplish-brown, 1-guttulate, about $8 \times 5 \mu$; stipe subequal, pallid, opaque, fibrillose, striate and granulose at the apex, white-tomentose at the base, about $1-1.5 \times 0.1$ cm.

Type collected by W. A. Murrill on a fallen decayed oak limb in a low hammock at Gainesville, Fla., Feb. 13, 1939 (*F 18137*). Found but once.

***Rigidoporus surinamensis subauberianus* var. nov.**

Pileo subdimidiato, imbricato, $6 \times 9 \times 1$ cm., multizonato, cremeo ad badio; tubulis minutis, brevibus, sporis globosis, $3-4 \mu$.

Pileus sessile, subdimidiato, plane, imbricate, about $6 \times 9 \times 1$ cm.; surface mostly glabrous, multizonate, sulcate, cremeous to badioid; margin cremeous, obtuse, 3 mm. thick, entire or slightly lobed; context subwoody, flexible when fresh, rigid when dry, 3-6 mm. thick, white, unchanging, odor strong when fresh and also while drying; tubes whitish, not stratified, 2-3 mm. long, 6 to a mm., regular, angular, entire, glistening when dry; spores globose, smooth, hyaline, 1-guttulate, $3-4 \mu$; cystidia none.

Type collected by W. A. Murrill on the base of a large living laurel oak in Gainesville, Fla., July 11, 1939 (*F 19722*). Intermediate between *R. surinamensis* and *Fomes Auberianus*; occurring on a living tree, apparently fruiting annually; and having a strong odor not reported for nearly related species. The color of the zones varies with age from cremeous through ochraceous and lateritious to badioid. Since the sporophores appeared on opposite sides of the trunk it is safe to conclude that a large part of the heartwood was affected.

NEW COMBINATIONS

For those using Saccardo's nomenclature the following new combinations are made:

Atylospora atomacea = ***Psathyra atomacea***

Atylospora subvestita = ***Psathyra subvestita***

Atylospora Weberi = ***Psathyra Weberi***

Camarophyllus fulvosiformis = ***Hygrophorus fulvosiformis***

Campanularius pumilus = ***Panaeolus pumilus***

Campanularius Westii = ***Panaeolus Westii***

Cortinellus azalearum = ***Tricholoma azalearum***

Drosophila alachuana = ***Hypholoma alachuanum***

Galerula canalipes = ***Galera canalipes***

Galerula crispella = ***Galera crispella***

Galerula fuscimarginata = ***Galera fuscimarginata***

Galerula subcrispa = ***Galera subcrispa***

Gymnopus atriceps = ***Collybia atriceps***

- Gymnopus coniceps* = *Collybia coniceps*
Hydrocybe roseiceps = *Hygrophorus roseiceps*
Lepista praevillosa = *Tricholoma praevillosum*
Melanoleuca entoloma = *Tricholoma entoloma*
Melanoleuca malodora = *Tricholoma malodorum*
Melanoleuca peralba = *Tricholoma peralbum*
Melanoleuca praebulbosa = *Tricholoma praebulbosum*
Melanoleuca subacris = *Tricholoma subacre*
Melanoleuca sublata = *Tricholoma sublatum*
Melanoleuca subrimosa = *Tricholoma subrimosum*
Melanoleuca virginea = *Tricholoma virgineum*
Omphalina alachuana = *Omphalia alachuana*
Pleuropus floridanus = *Clitopilus floridanus*
Pleuropus minimus = *Clitopilus minimus*
Pleuropus nyssicola = *Clitopilus nyssicola*
Volvariopsis alachuana = *Volvaria alachuana*
Volvariopsis fimetaria = *Volvaria fimetaria*

New or Noteworthy Tropical Fungi—II

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THE SUBGENUS *BOURDOTIA* IN TROPICAL AMERICA

The widespread occurrence of certain species of the subgenus *Bourdotia* of *Sebacina* in temperate North America has recently been brought out by McGuire (Lloydia 4: 1-43. 1941). Few of these have been reported from the tropics but the fact that thirteen of my collections from Panamá and Colombia are Bourdotias suggests that they may not be uncommon in such regions. One collection represents an apparently undescribed species; four are in rather poor condition and while they are undoubtedly Bourdotias, the specific determination is tentative; the remaining eight may be referred to four species, as follows:

Sebacina cinerea Bres. Nos. 2251, 2388 from the mountains of Chiriquí Province in western Panamá.

Sebacina deminuta Bourd. Nos. 2372, 4458 from the mountains of Chiriquí; No. 3062 from the Canal Zone.

Sebacina Eyrei Wakef. Nos. 3536, 3550 from the Sierra Nevada de Santa Marta, Colombia.

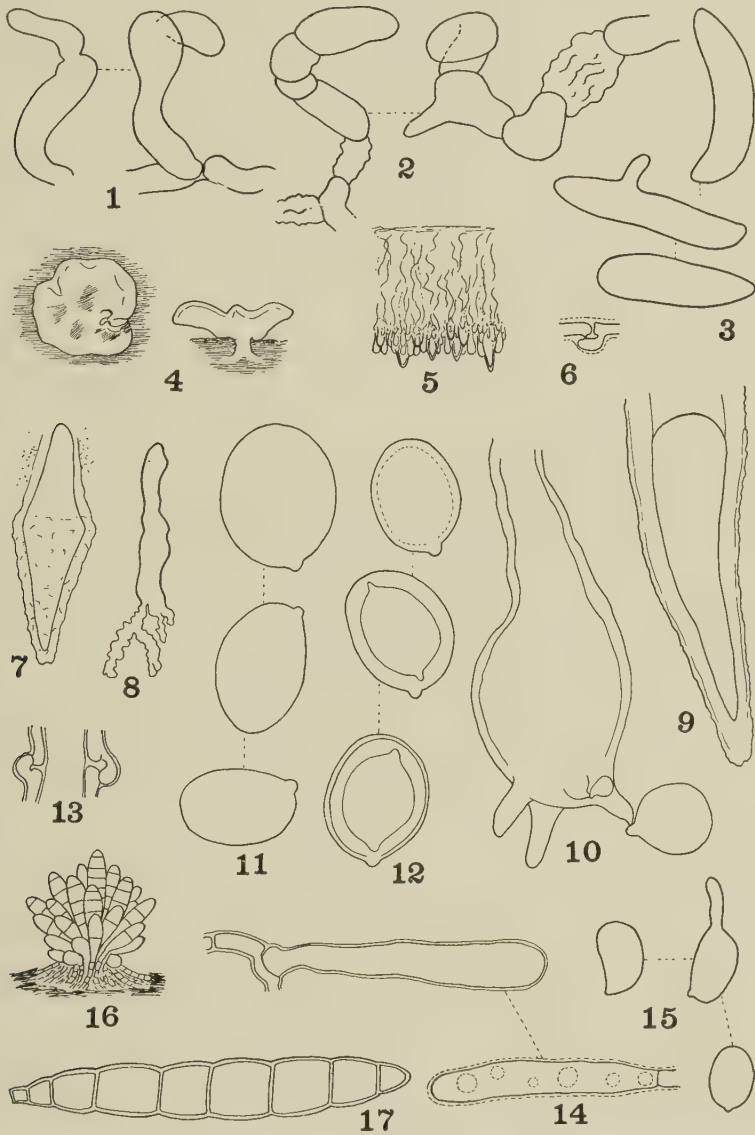
Sebacina Galzinii Bres. No. 2451 from the mountains of Chiriquí. The spores measure $8-10 \times 5.5-6\mu$, somewhat small for the species, but they are probably immature, especially as the basidia are of the usual size. This species is not to be confused with *Tremella pululahuana* Pat., an entirely different and very common tropical species which belongs in *Seismosarca* if that genus is to be recognized, and which I now believe is not distinct from *S. hydrophora* Cooke.

SEBACINA (HETEROCHAETELLA) DUBIA (B. & G.) Bourd.

This curious and aberrant species, discussed by McGuire (l.c.) in his recent paper, has been recorded, although rarely, from Europe and the United States. A collection from Brazil, communicated by the Rev. J. Rick, seems to represent its first recorded occurrence in the tropics of either hemisphere.

EOCRONARTIUM MUSCICOLA (Fries) Fitzp.

This species, widely distributed as a parasite on various mosses in Europe and the United States, was reported from Brazil by Rick (Egatea 18: 210. 1933) as *Protopistillaria muscigena* Rick. A collection from the Sierra Nevada de Santa Marta at an altitude of 1250-1500 m. (G.W.M. 3467) appears to be the second notice of its occurrence in tropical America. The host has been determined as *Mittenothamnium* (*Microthamnium*) *thelistegium* (C. Müll.) Card. by Dr. W. C. Steere. The Colombian specimen agrees



Figs. 1-3. *Eocronartium muscicola*. 1. Hypobasidia giving rise to epibasidia. 2. Four-celled epibasidia with shrivelled hypobasidia. 3. Three basidiospores, one germinating. All $\times 1000$.

Figs. 4-12. *Cytidia habgallae*. 4. Habit and longitudinal section, $\times 2$. 5. Longitudinal section showing immersed and emergent cystidia, $\times 40$. 6. Clamp-connection on internal hyphae. 7. Emergent cystidium, $\times 462$. 8. Branched paraphysis, $\times 462$. 9. Tip of cystidium, $\times 1000$. 10. Immature basidium, showing very thick gelatinous wall and two developing basidiospores, $\times 1000$. 11. Three thin-walled basidiospores, $\times 1000$. 12. Three basidiospores showing transition to thick-walled type, $\times 1000$.

Figs. 13-15. *Cytidia pezizoides*. 13. Clamp-connections from internal hyphae. 14. Two young basidia. 15. Three basidiospores, one germinating. All $\times 1000$.

Figs. 16-17. *Bactridium fulvellum*. 16. Sporodochium, $\times 40$. 17. Conidium, with stalk cell at base, $\times 462$.

in every respect with specimens from temperate North America. In transferring the species to *Helicobasidium*, Patouillard (Bull. Soc. Myc. France 36: 176. 1920) commented on the absence of probasidia in both genera. Stanley (Trans. Am. Microscop. Soc. 59: 407-413. 1940) showed that probasidia are regularly present in *Eocronartium*, remaining as empty, shrivelled hypobasidia after the protoplasm has migrated into the epibasidium and been cut off by a septum. I have recently published a camera lucida drawing (Univ. Iowa Stud. Nat. Hist. 18, Supp., pl. 6, f. 75) showing an entirely comparable basidium of *Helicobasidium purpureum* with empty, shrivelled hypobasidium at the base. As shown in the accompanying illustrations (Figs. 1-3) basidia and spores of the Colombian specimen are entirely like those illustrated by Stanley from Iowa collections.

***Cytidia habgallae*(Berk. & Br.) comb. nov.**

Corticium habgallae Berk. & Br. (Jour. Linn. Soc. Bot. 14: 72. 1873), from Ceylon, was transferred by Cooke (Grevillea 8: 20, pl. 124, f. 10. 1879) to *Peniophora*. In Cooke's illustration the cystidia are shown satisfactorily but the colored illustration, presumably a reconstruction from the dried specimen interpreted in the light of Berkeley's brief description, must be regarded as distinctly fanciful, especially when compared with the photograph and careful description given by Petch (Trans. Brit. Myc. Soc. 11: 78, pl. 2, f. 2, 1926). It is clear from Petch's description that the species is not at home in *Peniophora* but fits satisfactorily into *Cytidia*. Petch proved by culture methods that *Matula poroniaeformis* (Berk. & Br.) Massee was an imperfect stage of *Peniophora habgallae*. Recently I reported studies of *Matula Rompelii* (Rick) Lloyd (Jour. Wash. Acad. Sci. 30: 381. 1940) but hesitated to unite the American species with the Old World form because of the fact that the spores seemed to be developed in a different way from that described by Petch and because there was no mention in his paper of the curious secondary thickening of the spore wall, penetrated by peg-like projections of the lumen, which I found in the American specimens. Since this note was published, I have found among my own collections temporarily referred to *Aleurodiscus*, two *Cytidias* (Nos. 2216 and 2499) which I have no hesitation in referring to Berkeley and Broome's species, as interpreted by Cooke and by Petch, both from the locality in the mountains of western Panamá which yielded four of the collections of *Matula*, and have examined an additional collection from Colombia, Dept. Valle del Cauca, above Cali, collected by C. E. Chardon in 1937 and now in the Cornell University herbarium (Fungi of Colombia 876). The fructifications (Fig. 4) are irregularly discoid, centrally attached but otherwise free from the substratum, up to 7 mm. in diameter when dry, expanding to a centimeter or more when soaked and often larger by confluence, waxy, almost subgelatinous when wet, approaching horny when dry. In color, the youngest

fructifications, when wet, are white, the color deepening with age through pinkish buff (R) and pinkish cinnamon (R) to Sayal brown (R) vinaceous buff (R) or fawn color (R). When dry, the colors are paler and duller. In section (Fig. 5) the basidiocarps are approximately 1 mm. in thickness, rarely more than 1.2 mm. Petch says up to 3 mm. thick when fresh, but this may include the broad, thick, stalk-like base. The basal portion is composed of a dense outer layer and a broad central region of loosely interwoven, highly gelatinized hyphae bearing numerous clamp-connections (Fig. 6), the latter not infrequently distorted as in gelatinous *Heterobasidiomycetes*. The hymenium is composed of clavate, thick-walled basidia (Fig. 10), branched paraphyses (Fig. 8) and numerous fusiform cystidia (Figs. 7, 9), the cystidia mostly immersed but many protruding from the hymenium, mostly $60-100 \times 13-25\mu$, including the nearly smooth, faintly brownish crystalline wall which surrounds each cystidium. The basidia are very large, $60-70 \times 20-25\mu$, of homobasidiate type, with slender stalks and swollen tips. The basidiospores are broadly ovate, $16-20 \times 12-16\mu$, and at first thin-walled (Fig. 11). They appear to remain in considerable part immersed in the gelatinous layer at the surface and to become gradually imbedded in the substance of the fructification by its growth after their discharge, and there undergo a modification into spores with a thick, hyaline, double wall and a deeply staining, constricted lumen with two or more projecting pegs (Fig. 12) exactly as in the chlamydospores of *Matula*. In the *Cytidia* basidiospores, however, one of the pegs is always oriented toward the apiculus and another toward the distal end of the spore, and the apiculus persists through all stages, leaving no question that these structures are modified basidiospores and not chlamydospores as in *Matula*.

Cytidia cornea Lloyd (Myc. Writ. 5: 656. 1917) from South Africa is clearly the same species, although the spores are said to be "globose, $14-16\mu$, pale yellowish tint and surface uneven," and crested cystidia are said to be present. Lloyd sent a specimen to Bourdot and reproduces as Fig. 937 Bourdot's sketch of the hymenium. Three spores are shown, one at most subglobose and two distinctly oval. Two cystidia and two branched paraphyses are shown comparable with those here reproduced, but the structure which is evidently intended to represent a crested cystidium is in all probability based on a basidium which has discharged its spores. Later, Lloyd (Myc. Writ. 6: 930. 1920) transferred *C. cornea* to *Aleurodiscus* and described as new *A. capensis*, also from South Africa, in which he notes the presence of globose, hyaline, thick-walled bodies—doubtless the modified basidiospores. He adds: "If this proves to be the same as *Aleurodiscus corneus* I shall not be much surprised." His photographs (Figs. 1687 and 1688) certainly suggest they are the same. The following year (Myc. Writ. 6: 1088. 1921) he recorded *A. capensis* from Brazil, simultaneously

suggesting that a new genus, *Aleurocystis*, might be erected for it and that it be transferred to *Gloeosoma* as *G. capensis*.

Gloeosoma was proposed by Bresadola (Annales Myc. 18: 51. 1920) for a gelatinous, *Peziza*-like species from South America, *G. vitellina*, previously referred to *Exidia*, *Hirneola* and *Aleurodiscus*. Although Bresadola listed it under the Tremellaceae, there is nothing whatever in his description to suggest that it is a Heterobasidiomycete. Nevertheless, Killermann (in Engler & Prantl, ed. 2. 6: 115. 1928) includes it in his tribe Tremelleae of the Tremellaceae. It may prove to be either a *Cytidia* or a distinct, but closely related genus.

As I interpret the record in the light of the specimens examined, *Corticium habgallae* Berk. & Br., *Peniophora habgallae* (Berk. & Br.) Cke., *Cytidia cornea* Lloyd, *Aleurodiscus cornea* Lloyd, *A. capensis* Lloyd and *Gloeosoma capensis* Lloyd all apply to the same species, best referred to *Cytidia* under the original specific name as *C. habgallae*. *Matula poroniaeformis* (Berk. & Br.) Masee and *M. Rompelii* (Rick) Lloyd represent the imperfect stage of the same fungus. The species is widely distributed in the tropical regions of both hemispheres, occurring in Panamá, Colombia, Brazil, Ceylon and New Zealand and doubtless in many intermediate regions.

CYTIDIA PEZIZOIDES Pat.

This species, originally described from Indo-China by Patouillard as a *Corticium* (Jour. de Bot. 5: 314, 1891) and later transferred by its author to *Cytidia* (Essai Tax. 54. 1900) appears to be identical, so far as can be judged from the descriptions, with *Cytidia tremellosa* Lloyd (Myc. Writ. 4: Myc. Notes 38: 516. 1912). Lloyd gives a photograph showing the habit, both wet and dry, and reproduces drawings by Bresadola showing the microscopic characters. Burt (Ann. Missouri Bot. Gard. 11: 12, 1924) gives a more formal description, chiefly useful for its more precise designation of color. A rather scanty, but adequate collection from Barro Colorado Island in August, 1937 (G.W.M. 4118) agrees satisfactorily with all the descriptions cited. Clamp-connections, noted by Bresadola, are conspicuous on the internal hyphae of the basidiocarp (Fig. 13). The basidia, like those of the preceding species, have thick, gelatinous walls (Fig. 14). In the Panamá collection, the largest disk is 5 mm. in diameter when dry (Burt says 1-3 mm.); the spores (Fig. 15) are 8-10×5.5-6μ, very faintly colored under the microscope and touched with ochraceous in mass.

BACTRIDIIUM FULVELLUM Berk.

Berkeley's original description, appearing in the second part of the paper on Cuban fungi (Jour. Linn. Soc. Bot. 10: 354. 1869) is as follows:

Pallidum, laxum; sporis longissimis (464). On dead wood.

Hab. Venezuela. Spores .008-.016 inch long, 6-10-septate.

According to Farlow (Bibl. Index 311. 1905) Wright's Cuban specimen, on which this species is based, is "certainly very near to, if not identical with, *Bactridium flavum*," while a collection of Fendler's from Venezuela in the Curtis Herbarium is not the same species. An ample collection by Chardon and Toro from Venezuela, now in the herbarium of Cornell University (Fungi of Venezuela 1371) and an additional collection from Costa Rica by C. W. Dodge and C. F. Goerger (C.W.D. 9671) permit further comment on the species. The Cornell specimen consists of several fragments of bark from a dead log bearing perhaps two or three hundred of the pallid ochraceous sporodochia, each approximately a half millimeter in diameter when dry, expanding, when moistened, to a millimeter or more (Fig. 16). The specimen from Costa Rica, while not so ample, is entirely comparable. A note on the packet of the latter indicates that it was Capucine yellow when collected. The enormous spores (Fig. 17) are 200–240 \times 35–38 μ , excluding the stalk cell or cells which frequently remain attached, and are quite regularly 7-septate when mature. Occasional 8-septate spores occur and immature spores with fewer septa are, of course, abundant. Although the sporodochia expand when soaked, they do not become gelatinous, as in the very similar genus *Arthrosporium*. *Bactridium*, being sessile, is placed in the form family Tuberculariaceae, while *Arthrosporium*, although apparently closely related, must be referred to the Stilbaceae. The common *Bactridium flavum* Kze. of temperate Europe and North America differs in its smaller spores, looser and smaller sporodochia and duller color. It is possible that the tropical form is no more than a robust variety of the temperate species but it appears to be distinct.

ARTHROSPORIUM CHRYSOCEPHALUM Penz. & Sacc.

Originally described from Java (Icones Fung. Javan. 109. 1904), this species has not, to my knowledge, been since reported. Two collections from the Province of Chiriquí, in western Panamá, are tentatively assigned to it. One, No. 2592, from the valley of the upper Rio Chiriquí Viejo, is rather old. The other, No. 4393, from Casita Alta, above Boquete, on the other side of the mountain of Chiriquí, was in perfect condition when collected. Both collections differ from the species as described in their larger size, up to 4 mm. tall, in the yellow rather than white stipes and in the much longer conidia, which are 270–385 \times 37–42 μ as compared with 250–275 \times 40–44 μ , the dimensions given by Penzig and Saccardo. The Panamá specimens seem to bear much the same relation to the Javanese fungus that *Bactridium fulvellum* does to *B. flavum*, but I hesitate to designate them as distinct without additional material from the oriental tropics for comparison. The illustration accompanying the original description (l.c. Pl. 75, f. 4, incorrectly labelled "*Arthropodium*") would serve equally well for the Panamá specimens. In spite of its small size, the species is rather

striking. The gelatinous texture and brilliant orange color suggest to the naked eye a *Dacryomitra*, while under a lens the enormous spores projecting from the globose head resemble emergent cystidia.

Von Höhnelt (Sitzungsb. k. Akad. Wien, Math.-Nat. Kl. I. 125: 95. 1916) contends that *Arthrosporium* Sacc. 1880 is a synonym of *Atractium* Link 1809 and this is accepted by Clements and Shear (Gen. Fungi 407, 1931). Without discussing the merits of this question, it may be remarked that those species discussed by von Höhnelt may well be regarded as generically distinct from the tropical forms under consideration.